



# STIC Search Results Feedback Form

**EIC17000**

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader  
571/272-2505 REMSEN 4B28

## Voluntary Results Feedback Form

- I am an examiner in Workgroup:  Example: 1713  
➤ Relevant prior art found, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature  
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art not found:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28

=> fil reg

FILE 'REGISTRY' ENTERED AT 14:48:55 ON 14 DEC 2007

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<http://www.cas.org/support/stngen/stndoc/properties.html>

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(FILE 'HOME' ENTERED AT 14:27:59 ON 14 DEC 2007)

FILE 'HCAPLUS' ENTERED AT 14:28:22 ON 14 DEC 2007

L1 1 SEA ABB=ON PLU=ON US2007042272/PN  
SEL RN

FILE 'REGISTRY' ENTERED AT 14:31:04 ON 14 DEC 2007

L2 43 SEA ABB=ON PLU=ON (10102-24-6/BI OR 10377-48-7/BI OR  
10377-52-3/BI OR 12003-67-7/BI OR 12025-11-5/BI OR  
12057-24-8/BI OR 12315-28-5/BI OR 12355-58-7/BI OR  
13453-69-5/BI OR 13453-84-4/BI OR 554-13-2/BI OR  
693781-19-0/BI OR 7440-06-4/BI OR 816415-83-5/BI OR  
816415-84-6/BI OR 816415-85-7/BI OR 816416-34-9/BI OR  
816416-36-1/BI OR 816416-38-3/BI OR 816416-40-7/BI OR  
816416-42-9/BI OR 816416-44-1/BI OR 816416-46-3/BI OR  
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816416-56-5/BI OR 816416-58-7/BI OR 816416-60-1/BI OR  
816416-62-3/BI OR 816416-64-5/BI OR 816416-66-7/BI OR  
816416-68-9/BI OR 816416-70-3/BI OR 816416-72-5/BI OR  
816416-74-7/BI OR 816416-76-9/BI OR 816416-78-1/BI OR  
816416-80-5/BI OR 816416-83-8/BI OR 816416-84-9/BI OR  
816416-86-1/BI OR 944251-30-3/BI)  
D SCA

L3 22753 SEA ABB=ON PLU=ON (LI(L) (SI OR B OR GE OR AL OR C OR  
GA OR S) (L)O(L)N)/ELS  
SAV L3 TEMP LEW238/A

L4 28 SEA ABB=ON PLU=ON L3 AND L2  
D SCA

L5 338 SEA ABB=ON PLU=ON L3 AND TIS/CI

L6 28 SEA ABB=ON PLU=ON L2 AND L5

L7 338 SEA ABB=ON PLU=ON L5 AND 0.6-5/LI

L8 327 SEA ABB=ON PLU=ON L7 AND 1-4/O

L9 102 SEA ABB=ON PLU=ON L8 AND 0.01-0.5/N  
L10 25 SEA ABB=ON PLU=ON L2 AND L9  
L11 3 SEA ABB=ON PLU=ON L6 NOT L10  
D SCA

FILE 'HCAPLUS' ENTERED AT 14:42:03 ON 14 DEC 2007

L12 6 SEA ABB=ON PLU=ON L10  
L13 35 SEA ABB=ON PLU=ON L9  
L14 35 SEA ABB=ON PLU=ON L12 OR L13  
L15 26 SEA ABB=ON PLU=ON L14 AND (PY<=2004 OR PRY<=2004 OR  
AY<=2004)  
L16 5 SEA ABB=ON PLU=ON L15 AND L12  
L17 21 SEA ABB=ON PLU=ON L15 NOT L16

=> fil hcap

FILE 'HCAPLUS' ENTERED AT 14:48:57 ON 14 DEC 2007

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FILE COVERS 1907 - 14 Dec 2007 VOL 147 ISS 26

FILE LAST UPDATED: 13 Dec 2007 (20071213/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d l16 ibib abs hitstr hitind 1-5

L16 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2006:443057 HCAPLUS

DOCUMENT NUMBER: 144:436139

TITLE: Solid electrolyte lithium battery using lithium phosphorus mixed oxide or lithium mixed oxynitride electrolyte

INVENTOR(S): Ukaji, Masaya; Mino, Shinji; Shibano, Yasuyuki; Ito, Shuji

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006120437

A

20060511

JP 2004-306650

200410  
21

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PRIORITY APPLN. INFO.:

JP 2004-306650

200410  
21

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AB The disclosed battery has a Li ion-conductive solid electrolyte and amorphous SiO<sub>2</sub> which is chemical bonded to the interfaces between the electrolyte and anode and/or cathode active mass, wherein the electrolyte is a compound represented by (1) Li<sub>x</sub>PTyO<sub>z</sub> (T = Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zr, Nb, Mo, Ru, Ag, Ta, W, Pt and/or Au; x = 2.0-7.0; y = 0.01-1.0; z = 3.5-8.0) or (2) Li<sub>x</sub>MOyN<sub>z</sub> [M = Si, B, Ge, Al, C, Ga and/or S; x = 0.6-1.0, y = 1.05-1.99, z = 0.01-0.5; x = 1.6-2.0, y = 2.05-2.99, z = 0.01-0.5; x = 1.6-2.0, y = 3.05-3.99, z = 0.01-0.5; or x = 4.6-5.0, y = 3.05-3.99, z = 0.01-0.5]. The solid electrolyte has high moisture resistance and ion conductivity, and the battery shows low internal resistance and long cycle life.

IT 816415-85-7, Boron lithium nitride oxide (BLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>)  
 816416-34-9, Germanium lithium nitride oxide  
 (GeLi<sub>1.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>) 816416-38-3, Aluminum lithium nitride  
 oxide (AlLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) 816416-40-7, Aluminum lithium  
 nitride oxide (AlLi<sub>4.8</sub>N<sub>0.3</sub>O<sub>3.45</sub>) 816416-42-9, Carbon  
 lithium nitride oxide (CLi<sub>1.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>) 816416-44-1,  
 Gallium lithium nitride oxide (GaLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) 816416-46-3  
 , Lithium sulfur nitride oxide (Li<sub>1.8</sub>SN<sub>0.3</sub>O<sub>3.45</sub>) 816416-50-9  
 , Boron lithium nitride oxide silicate (B<sub>0.5</sub>Li<sub>2.3</sub>N<sub>0.3</sub>O<sub>0.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
 816416-52-1, Germanium lithium nitride oxide silicate  
 (Ge<sub>0.5</sub>Li<sub>3.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>) 816416-54-3, Carbon lithium  
 nitride oxide silicate (C<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.3</sub>O<sub>2.95</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
 816416-56-5, Lithium silicon nitride oxide sulfate  
 (Li<sub>2.8</sub>Si<sub>0.5</sub>N<sub>0.3</sub>O<sub>1.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>) 816416-58-7, Germanium  
 lithium borate nitride oxide (Ge<sub>0.5</sub>Li<sub>2.3</sub>(BO<sub>3</sub>)<sub>0.5</sub>N<sub>0.3</sub>O<sub>0.95</sub>)  
 816416-60-1, Aluminum lithium borate nitride oxide  
 (Al<sub>0.5</sub>Li<sub>2.8</sub>(BO<sub>3</sub>)<sub>0.5</sub>N<sub>0.3</sub>O<sub>0.95</sub>) 816416-62-3, Boron lithium  
 carbonate nitride oxide (B<sub>0.5</sub>Li<sub>1.3</sub>(CO<sub>3</sub>)<sub>0.5</sub>N<sub>0.3</sub>O<sub>0.45</sub>)  
 816416-64-5, Gallium lithium borate nitride oxide  
 (Ga<sub>0.5</sub>Li<sub>0.8</sub>(BO<sub>2</sub>)<sub>0.5</sub>N<sub>0.3</sub>O<sub>0.45</sub>) 816416-66-7, Boron lithium  
 nitride oxide sulfate (B<sub>0.5</sub>Li<sub>1.3</sub>N<sub>0.3</sub>O<sub>0.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>)  
 816416-68-9 816416-70-3, Germanium lithium nitride  
 oxide sulfate (Ge<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>) 816416-72-5,  
 Aluminum gallium lithium nitride oxide (Al<sub>0.5</sub>Ga<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>)  
 816416-74-7, Carbon lithium nitride oxide sulfate  
 (C<sub>0.5</sub>Li<sub>1.8</sub>N<sub>0.3</sub>O<sub>0.95</sub>(SO<sub>4</sub>)<sub>0.5</sub>) 882682-64-6, Lithium silicon  
 nitride oxide (Li<sub>1.8</sub>SiN<sub>0.5</sub>O<sub>2.15</sub>) 884739-67-7, Lithium  
 silicon nitride oxide (Li<sub>1.8</sub>SiN<sub>0.3</sub>O<sub>2.45</sub>) 885096-04-8,  
 Lithium silicon nitride oxide (Li<sub>1.8</sub>SiN<sub>0.1</sub>O<sub>2.88</sub>)  
 885096-05-9, Lithium silicon nitride oxide  
 (Li<sub>1.8</sub>SiN<sub>0.1</sub>O<sub>2.75</sub>)

RL: DEV (Device component use)

(solid electrolyte Li battery with long cycle life using  
 Li-P-transition metal mixed oxide or Li mixed oxynitride  
 electrolyte)

RN 816415-85-7 HCAPLUS

CN Boron lithium nitride oxide (BLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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=====+=====+=====		
N	0.3	17778-88-0
O	1.45	17778-80-2
B	1	7440-42-8
Li	0.8	7439-93-2

RN 816416-34-9 HCAPLUS

CN Germanium lithium nitride oxide (GeLi1.8N0.3O2.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
N	0.3	17778-88-0
O	2.45	17778-80-2
Ge	1	7440-56-4
Li	1.8	7439-93-2

RN 816416-38-3 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi0.8N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
N	0.3	17778-88-0
O	1.45	17778-80-2
Li	0.8	7439-93-2
Al	1	7429-90-5

RN 816416-40-7 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi4.8N0.3O3.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
N	0.3	17778-88-0
O	3.45	17778-80-2
Li	4.8	7439-93-2
Al	1	7429-90-5

RN 816416-42-9 HCAPLUS

CN Carbon lithium nitride oxide (CLi1.8N0.3O2.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
N	0.3	17778-88-0
O	2.45	17778-80-2
C	1	7440-44-0
Li	1.8	7439-93-2

RN 816416-44-1 HCAPLUS

CN Gallium lithium nitride oxide (GaLi0.8N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
N	0.3	17778-88-0
O	1.45	17778-80-2
Ga	1	7440-55-3
Li	0.8	7439-93-2

RN 816416-46-3 HCAPLUS

CN Lithium sulfur nitride oxide (Li1.8SN0.3O3.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	3.45	17778-80-2
S	1	7704-34-9
Li	1.8	7439-93-2

RN 816416-50-9 HCAPLUS

CN Boron lithium nitride oxide silicate (B0.5Li2.3N0.3O0.45(SiO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
O4Si	0.5	17181-37-2
B	0.5	7440-42-8
Li	2.3	7439-93-2

RN 816416-52-1 HCAPLUS

CN Germanium lithium nitride oxide silicate  
(Ge0.5Li3.8N0.3O1.45(SiO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
O4Si	0.5	17181-37-2
Ge	0.5	7440-56-4
Li	3.8	7439-93-2

RN 816416-54-3 HCAPLUS

CN Carbon lithium nitride oxide silicate (C0.5Li2.8N0.3O2.95(SiO4)0.5)  
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.95	17778-80-2
O4Si	0.5	17181-37-2
C	0.5	7440-44-0
Li	2.8	7439-93-2

RN 816416-56-5 HCAPLUS

CN Lithium silicon nitride oxide sulfate (Li2.8Si0.5N0.3O1.45(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2

O4S	0.5	14808-79-8
Si	0.5	7440-21-3
Li	2.8	7439-93-2

RN 816416-58-7 HCAPLUS

CN Germanium lithium borate nitride oxide (Ge0.5Li2.3(BO3)0.5N0.3O0.95)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Ge	0.5	7440-56-4
Li	2.3	7439-93-2

RN 816416-60-1 HCAPLUS

CN Aluminum lithium borate nitride oxide (Al0.5Li2.8(BO3)0.5N0.3O0.95)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Li	2.8	7439-93-2
Al	0.5	7429-90-5

RN 816416-62-3 HCAPLUS

CN Boron lithium carbonate nitride oxide (B0.5Li1.3(CO3)0.5N0.3O0.45)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.45	17778-80-2
B	0.5	7440-42-8
Li	1.3	7439-93-2
CO3	0.5	3812-32-6

RN 816416-64-5 HCAPLUS

CN Gallium lithium borate nitride oxide (Ga0.5Li0.8(BO2)0.5N0.3O0.45)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.45	17778-80-2
BO2	0.5	14100-65-3
Ga	0.5	7440-55-3
Li	0.8	7439-93-2

RN 816416-66-7 HCAPLUS

CN Boron lithium nitride oxide sulfate (B0.5Li1.3N0.3O0.45(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.45	17778-80-2
O4S	0.5	14808-79-8
B	0.5	7440-42-8
Li	1.3	7439-93-2

RN 816416-68-9 HCAPLUS

CN Germanium lithium carbonate nitride oxide  
(Ge0.5Li2.8(CO3)0.5NO.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
Ge	0.5	7440-56-4
Li	2.8	7439-93-2
CO3	0.5	3812-32-6

RN 816416-70-3 HCAPLUS

CN Germanium lithium nitride oxide sulfate  
(Ge0.5Li2.8NO.3O1.45(SO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
O4S	0.5	14808-79-8
Ge	0.5	7440-56-4
Li	2.8	7439-93-2

RN 816416-72-5 HCAPLUS

CN Aluminum gallium lithium nitride oxide (Al0.5Ga0.5Li2.8NO.3O2.45)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
Ga	0.5	7440-55-3
Li	2.8	7439-93-2
Al	0.5	7429-90-5

RN 816416-74-7 HCAPLUS

CN Carbon lithium nitride oxide sulfate (C0.5Li1.8NO.3O0.95(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
O4S	0.5	14808-79-8
C	0.5	7440-44-0
Li	1.8	7439-93-2



RN 882682-64-6 HCAPLUS

CN Lithium silicon nitride oxide (Li<sub>1.8</sub>SiN<sub>0.5</sub>O<sub>2.15</sub>) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.5	17778-88-0
O	2.15	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

RN 884739-67-7 HCAPLUS

CN Lithium silicon nitride oxide (Li<sub>1.8</sub>SiN<sub>0.3</sub>O<sub>2.45</sub>) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	2.45	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

RN 885096-04-8 HCAPLUS

CN Lithium silicon nitride oxide (Li<sub>1.8</sub>SiN<sub>0.01</sub>O<sub>2.88</sub>) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.01	17778-88-0
O	2.88	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

RN 885096-05-9 HCAPLUS

CN Lithium silicon nitride oxide (Li<sub>1.8</sub>SiN<sub>0.1</sub>O<sub>2.75</sub>) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.1	17778-88-0
O	2.75	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 76

IT 782495-23-2, Lithium titanium metaphosphate oxide  
 (Li<sub>2.8</sub>Ti<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-24-3, Lithium vanadium metaphosphate  
 oxide (Li<sub>2.8</sub>V<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-25-4, Chromium lithium  
 metaphosphate oxide (Cr<sub>0.2</sub>Li<sub>2.8</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-26-5, Lithium  
 manganese metaphosphate oxide (Li<sub>2.8</sub>Mn<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-27-6,  
 Iron lithium metaphosphate oxide (Fe<sub>0.2</sub>Li<sub>2.8</sub>(PO<sub>3</sub>)O<sub>0.9</sub>)  
 782495-28-7, Cobalt lithium metaphosphate oxide  
 (Co<sub>0.2</sub>Li<sub>2.8</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-29-8, Lithium nickel metaphosphate  
 oxide (Li<sub>2.8</sub>Ni<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-30-1, Copper lithium

metaphosphate oxide ( $\text{Cu}_0.2\text{Li}_{2.8}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-31-2, Lithium  
 zirconium metaphosphate oxide ( $\text{Li}_{2.8}\text{Zr}_{0.2}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-32-3,  
 Lithium niobium metaphosphate oxide ( $\text{Li}_{2.8}\text{Nb}_{0.2}(\text{PO}_3)\text{O}_{0.9}$ )  
 782495-33-4, Lithium molybdenum metaphosphate oxide  
 ( $\text{Li}_{2.8}\text{Mo}_{0.2}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-34-5, Lithium ruthenium metaphosphate  
 oxide ( $\text{Li}_{2.8}\text{Ru}_{0.2}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-35-6, Lithium silver  
 metaphosphate oxide ( $\text{Li}_{2.8}\text{Ag}_{0.2}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-36-7, Lithium  
 tantalum metaphosphate oxide ( $\text{Li}_{2.8}\text{Ta}_{0.2}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-37-8,  
 Lithium tungsten metaphosphate oxide ( $\text{Li}_{2.8}\text{W}_{0.2}(\text{PO}_3)\text{O}_{0.9}$ )  
 782495-38-9, Lithium platinum metaphosphate oxide  
 ( $\text{Li}_{2.8}\text{Pt}_{0.2}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-39-0, Gold lithium metaphosphate  
 oxide ( $\text{Au}_{0.2}\text{Li}_{2.8}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-41-4, Lithium tungsten  
 metaphosphate oxide ( $\text{Li}_{2.8}\text{W}_{0.01}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-42-5, Lithium  
 tungsten metaphosphate oxide ( $\text{Li}_{2.8}\text{W}_{0.05}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-43-6,  
 Lithium tungsten metaphosphate oxide ( $\text{Li}_{2.8}\text{W}_{0.1}(\text{PO}_3)\text{O}_{0.9}$ )  
 782495-44-7, Lithium tungsten metaphosphate oxide  
 ( $\text{Li}_{2.8}\text{W}_{0.5}(\text{PO}_3)\text{O}_{0.9}$ ) 782495-47-0, Lithium vanadium oxide phosphate  
 ( $\text{Li}_{2.8}\text{V}_{0.200.4}(\text{PO}_4)$ ) 782495-48-1, Chromium lithium oxide phosphate  
 ( $\text{Cr}_{0.2}\text{Li}_{2.800.2}(\text{PO}_4)$ ) 782495-49-2, Lithium manganese oxide  
 phosphate ( $\text{Li}_{2.8}\text{Mn}_{0.200.3}(\text{PO}_4)$ ) 782495-50-5, Iron lithium oxide  
 phosphate ( $\text{Fe}_{0.2}\text{Li}_{2.800.17}(\text{PO}_4)$ ) 782495-51-6, Cobalt lithium oxide  
 phosphate ( $\text{Co}_{0.2}\text{Li}_{2.800.17}(\text{PO}_4)$ ) 782495-52-7, Lithium nickel oxide  
 phosphate ( $\text{Li}_{2.8}\text{Ni}_{0.200.1}(\text{PO}_4)$ ) 782495-53-8, Copper lithium oxide  
 phosphate ( $\text{Cu}_{0.2}\text{Li}_{2.800.1}(\text{PO}_4)$ ) 782495-54-9, Lithium zirconium  
 oxide phosphate ( $\text{Li}_{2.8}\text{Zr}_{0.200.3}(\text{PO}_4)$ ) 782495-55-0, Lithium niobium  
 oxide phosphate ( $\text{Li}_{2.8}\text{Nb}_{0.200.4}(\text{PO}_4)$ ) 782495-56-1, Lithium  
 molybdenum oxide phosphate ( $\text{Li}_{2.8}\text{Mo}_{0.200.5}(\text{PO}_4)$ ) 782495-57-2,  
 Lithium silver phosphate ( $\text{Li}_{2.8}\text{Ag}_{0.2}(\text{PO}_4)$ ) 782495-58-3, Lithium  
 tantalum oxide phosphate ( $\text{Li}_{2.8}\text{Ta}_{0.200.4}(\text{PO}_4)$ ) 782495-59-4,  
 Lithium tungsten oxide phosphate ( $\text{Li}_{2.8}\text{W}_{0.200.5}(\text{PO}_4)$ ) 782495-60-7,  
 Lithium titanium oxide phosphate ( $\text{Li}_{4}\text{Ti}_{0.250}(\text{PO}_4)$ ) 782495-61-8,  
 Lithium vanadium oxide phosphate ( $\text{Li}_{3.75}\text{V}_{0.250}(\text{PO}_4)$ ) 782495-62-9,  
 Chromium lithium oxide phosphate ( $\text{Cr}_{0.25}\text{Li}_{3.50}(\text{PO}_4)$ ) 782495-63-0,  
 Lithium manganese oxide phosphate ( $\text{Li}_{3.25}\text{Mn}_{0.250}(\text{PO}_4)$ )  
 782495-64-1, Lithium niobium oxide phosphate ( $\text{Li}_{3.75}\text{Nb}_{0.250}(\text{PO}_4)$ )  
 782495-65-2, Lithium molybdenum oxide phosphate ( $\text{Li}_{3.5}\text{Mo}_{0.250}(\text{PO}_4)$ )  
 782495-66-3, Lithium tantalum oxide phosphate ( $\text{Li}_{3.75}\text{Ta}_{0.250}(\text{PO}_4)$ )  
 782495-67-4, Lithium tungsten oxide phosphate ( $\text{Li}_{3.5}\text{W}_{0.250}(\text{PO}_4)$ )  
 782495-69-6, Lithium tungsten oxide phosphate  
 ( $\text{Li}_{3.02}\text{W}_{0.0100.04}(\text{PO}_4)$ ) 782495-70-9, Lithium tungsten oxide  
 phosphate ( $\text{Li}_{3.2}\text{W}_{0.100.4}(\text{PO}_4)$ ) 782495-72-1, Lithium tungsten oxide  
 phosphate ( $\text{Li}_{3.66}\text{W}_{0.3301.32}(\text{PO}_4)$ ) 782495-74-3, Lithium tungsten  
 oxide phosphate ( $\text{Li}_5\text{W}_4(\text{PO}_4)$ ) 816415-85-7, Boron lithium  
 nitride oxide ( $\text{BLi}_{0.8}\text{N}_{0.301.45}$ ) 816416-34-9, Germanium  
 lithium nitride oxide ( $\text{GeLi}_{1.8}\text{N}_{0.302.45}$ ) 816416-38-3,  
 Aluminum lithium nitride oxide ( $\text{AlLi}_{0.8}\text{N}_{0.301.45}$ )  
 816416-40-7, Aluminum lithium nitride oxide  
 ( $\text{AlLi}_{4.8}\text{N}_{0.303.45}$ ) 816416-42-9, Carbon lithium nitride  
 oxide ( $\text{CLi}_{1.8}\text{N}_{0.302.45}$ ) 816416-44-1, Gallium lithium  
 nitride oxide ( $\text{GaLi}_{0.8}\text{N}_{0.301.45}$ ) 816416-46-3, Lithium  
 sulfur nitride oxide ( $\text{Li}_{1.8}\text{S}\text{N}_{0.303.45}$ ) 816416-50-9, Boron  
 lithium nitride oxide silicate ( $\text{B}_{0.5}\text{Li}_{2.3}\text{N}_{0.300.45}(\text{SiO}_4)_{0.5}$ )  
 816416-52-1, Germanium lithium nitride oxide silicate  
 ( $\text{Ge}_{0.5}\text{Li}_{3.8}\text{N}_{0.301.45}(\text{SiO}_4)_{0.5}$ ) 816416-54-3, Carbon lithium  
 nitride oxide silicate ( $\text{C}_{0.5}\text{Li}_{2.8}\text{N}_{0.302.95}(\text{SiO}_4)_{0.5}$ )  
 816416-56-5, Lithium silicon nitride oxide sulfate  
 ( $\text{Li}_{2.8}\text{Si}_{0.5}\text{N}_{0.301.45}(\text{SO}_4)_{0.5}$ ) 816416-58-7, Germanium  
 lithium borate nitride oxide ( $\text{Ge}_{0.5}\text{Li}_{2.3}(\text{BO}_3)_{0.5}\text{N}_{0.300.95}$ )  
 816416-60-1, Aluminum lithium borate nitride oxide  
 ( $\text{Al}_{0.5}\text{Li}_{2.8}(\text{BO}_3)_{0.5}\text{N}_{0.300.95}$ ) 816416-62-3, Boron lithium

carbonate nitride oxide (B0.5Li1.3(CO3)0.5N0.3O0.45)  
 816416-64-5, Gallium lithium borate nitride oxide  
 (Ga0.5Li0.8(BO2)0.5N0.3O0.45) 816416-66-7, Boron lithium  
 nitride oxide sulfate (B0.5Li1.3N0.3O0.45(SO4)0.5)  
 816416-68-9 816416-70-3, Germanium lithium nitride  
 oxide sulfate (Ge0.5Li2.8N0.3O1.45(SO4)0.5) 816416-72-5,  
 Aluminum gallium lithium nitride oxide (Al0.5Ga0.5Li2.8N0.3O2.45)  
 816416-74-7, Carbon lithium nitride oxide sulfate  
 (C0.5Li1.8N0.3O0.95(SO4)0.5) 882681-95-0, Lithium titanium oxide  
 phosphate (Li2.8Ti0.2O0.3(PO4)) 882682-19-1, Lithium zirconium  
 oxide phosphate (Li4Zr0.25O(PO4)) 882682-64-6, Lithium  
 silicon nitride oxide (Li1.8SiN0.5O2.15) 884739-67-7,  
 Lithium silicon nitride oxide (Li1.8SiN0.3O2.45) 885096-04-8  
 , Lithium silicon nitride oxide (Li1.8SiN0.01O2.88)  
 885096-05-9, Lithium silicon nitride oxide  
 (Li1.8SiN0.1O2.75)  
 RL: DEV (Device component use)  
 (solid electrolyte Li battery with long cycle life using  
 Li-P-transition metal mixed oxide or Li mixed oxynitride  
 electrolyte)

L16 ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2006:443021 HCAPLUS

DOCUMENT NUMBER: 144:436133

TITLE: Lithium secondary batteries having wet-stable  
 oxide or nitride-based ionic conductors and  
 their anodes

INVENTOR(S): Ukaji, Masaya; Mino, Shinji; Shibano, Yasuyuki;  
 Ito, Shuji

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006120337	A	20060511	JP 2004-304089	20041019

20041019

PRIORITY APPLN. INFO.:

JP 2004-304089

20041019

AB The anodes consist of Li-precipitating conductive substrates and Li ion-conductive layers represented by  $Lx_1PTy_1Oz_1$  or  $Lx_2MOy_2Nz_2$  [T = Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zr, Nb, Mo, Ru, Ag, Ta, W, Pt, and/or Au;  $2.0 \leq x_1 \leq 7.0$ ;  $0.01 \leq y_1 \leq 1.0$ ;  $3.5 \leq z_1 \leq 8.0$ ; M = Si, B, Ge, Al, C, Ga, and/or S; plural range sets of (x2, y2, z2) are given] and being formed on the substrate surface. Lithium secondary batteries employing the anodes suppress rise in anode impedance and show long cycle life.

IT 816415-85-7P, Boron lithium nitride oxide (BLi0.8N0.3O1.45)  
 816416-34-9P, Germanium lithium nitride oxide (GeLi1.8N0.3O2.45) 816416-38-3P, Aluminum lithium nitride oxide (AlLi0.8N0.3O1.45) 816416-40-7P, Aluminum lithium

nitride oxide (AlLi<sub>4.8</sub>N<sub>0.3</sub>O<sub>3.45</sub>) 816416-44-1P, Gallium  
 lithium nitride oxide (GaLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) 816416-46-3P,  
 Lithium sulfur nitride oxide (Li<sub>1.8</sub>S<sub>0.3</sub>N<sub>0.3</sub>O<sub>3.45</sub>) 816416-50-9P,  
 , Boron lithium nitride oxide silicate (B<sub>0.5</sub>Li<sub>2.3</sub>N<sub>0.3</sub>O<sub>0.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
 816416-52-1P, Germanium lithium nitride oxide silicate  
 (Ge<sub>0.5</sub>Li<sub>3.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>) 816416-54-3P, Carbon  
 lithium nitride oxide silicate (C<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.3</sub>O<sub>2.95</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
 816416-56-5P, Lithium silicon nitride oxide sulfate  
 (Li<sub>2.8</sub>Si<sub>0.5</sub>N<sub>0.3</sub>O<sub>1.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>) 816416-58-7P, Germanium  
 lithium borate nitride oxide (Ge<sub>0.5</sub>Li<sub>2.3</sub>(BO<sub>3</sub>)<sub>0.5</sub>N<sub>0.3</sub>O<sub>0.95</sub>)  
 816416-60-1P, Aluminum lithium borate nitride oxide  
 (Al<sub>0.5</sub>Li<sub>2.8</sub>(BO<sub>3</sub>)<sub>0.5</sub>N<sub>0.3</sub>O<sub>0.95</sub>) 816416-62-3P, Boron lithium  
 carbonate nitride oxide (B<sub>0.5</sub>Li<sub>1.3</sub>(CO<sub>3</sub>)<sub>0.5</sub>N<sub>0.3</sub>O<sub>0.45</sub>)  
 816416-64-5P, Gallium lithium borate nitride oxide  
 (Ga<sub>0.5</sub>Li<sub>0.8</sub>(BO<sub>2</sub>)<sub>0.5</sub>N<sub>0.3</sub>O<sub>0.45</sub>) 816416-66-7P, Boron lithium  
 nitride oxide sulfate (B<sub>0.5</sub>Li<sub>1.3</sub>N<sub>0.3</sub>O<sub>0.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>)  
 816416-68-9P 816416-70-3P, Germanium lithium  
 nitride oxide sulfate (Ge<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>)  
 816416-72-5P, Aluminum gallium lithium nitride oxide  
 (Al<sub>0.5</sub>Ga<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>) 816416-74-7P, Carbon lithium  
 nitride oxide sulfate (C<sub>0.5</sub>Li<sub>1.8</sub>N<sub>0.3</sub>O<sub>0.95</sub>(SO<sub>4</sub>)<sub>0.5</sub>)  
 882682-64-6P, Lithium silicon nitride oxide  
 (Li<sub>1.8</sub>Si<sub>0.5</sub>N<sub>0.2</sub>O<sub>1.5</sub>) 884739-67-7P, Lithium silicon nitride  
 oxide (Li<sub>1.8</sub>Si<sub>0.3</sub>N<sub>0.2</sub>O<sub>1.45</sub>) 885122-24-7P, Aluminum lithium  
 nitride oxide (AlLi<sub>1.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>)  
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
 (Preparation)

(anodes; manufacture of lithium secondary batteries having wet-stable  
 oxide or nitride-based ionic conductors)

RN 816415-85-7 HCAPLUS

CN Boron lithium nitride oxide (BLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
B	1	7440-42-8
Li	0.8	7439-93-2

RN 816416-34-9 HCAPLUS

CN Germanium lithium nitride oxide (GeLi<sub>1.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	2.45	17778-80-2
Ge	1	7440-56-4
Li	1.8	7439-93-2

RN 816416-38-3 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
Li	0.8	7439-93-2

Al | 1 | 7429-90-5

RN 816416-40-7 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi<sub>4.8</sub>N<sub>0.3</sub>O<sub>3.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	3.45	17778-80-2
Li	4.8	7439-93-2
Al	1	7429-90-5

RN 816416-44-1 HCAPLUS

CN Gallium lithium nitride oxide (GaLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
Ga	1	7440-55-3
Li	0.8	7439-93-2

RN 816416-46-3 HCAPLUS

CN Lithium sulfur nitride oxide (Li<sub>1.8</sub>SN<sub>0.3</sub>O<sub>3.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	3.45	17778-80-2
S	1	7704-34-9
Li	1.8	7439-93-2

RN 816416-50-9 HCAPLUS

CN Boron lithium nitride oxide silicate (B<sub>0.5</sub>Li<sub>2.3</sub>N<sub>0.3</sub>O<sub>0.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
O <sub>4</sub> Si	0.5	17181-37-2
B	0.5	7440-42-8
Li	2.3	7439-93-2

RN 816416-52-1 HCAPLUS

CN Germanium lithium nitride oxide silicate  
(Ge<sub>0.5</sub>Li<sub>3.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
O <sub>4</sub> Si	0.5	17181-37-2
Ge	0.5	7440-56-4
Li	3.8	7439-93-2

RN 816416-54-3 HCAPLUS

CN Carbon lithium nitride oxide silicate (C0.5Li2.8N0.3O2.95(SiO4)0.5)  
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
O4Si	0.5	17181-37-2
C	0.5	7440-44-0
Li	2.8	7439-93-2

RN 816416-56-5 HCAPLUS

CN Lithium silicon nitride oxide sulfate (Li2.8Si0.5N0.3O1.45(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
O4S	0.5	14808-79-8
Si	0.5	7440-21-3
Li	2.8	7439-93-2

RN 816416-58-7 HCAPLUS

CN Germanium lithium borate nitride oxide (Ge0.5Li2.3(BO3)0.5N0.3O0.95)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Ge	0.5	7440-56-4
Li	2.3	7439-93-2

RN 816416-60-1 HCAPLUS

CN Aluminum lithium borate nitride oxide (Al0.5Li2.8(BO3)0.5N0.3O0.95)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Li	2.8	7439-93-2
Al	0.5	7429-90-5

RN 816416-62-3 HCAPLUS

CN Boron lithium carbonate nitride oxide (B0.5Li1.3(CO3)0.5N0.3O0.45)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====

N	0.3	17778-88-0
O	0.45	17778-80-2
B	0.5	7440-42-8
Li	1.3	7439-93-2
CO3	0.5	3812-32-6

RN 816416-64-5 HCAPLUS

CN Gallium lithium borate nitride oxide (Ga0.5Li0.8(BO2)0.5N0.3O0.45)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
BO2	0.5	14100-65-3
Ga	0.5	7440-55-3
Li	0.8	7439-93-2

RN 816416-66-7 HCAPLUS

CN Boron lithium nitride oxide sulfate (B0.5Li1.3N0.3O0.45(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
O4S	0.5	14808-79-8
B	0.5	7440-42-8
Li	1.3	7439-93-2

RN 816416-68-9 HCAPLUS

CN Germanium lithium carbonate nitride oxide  
(Ge0.5Li2.8(CO3)0.5N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
Ge	0.5	7440-56-4
Li	2.8	7439-93-2
CO3	0.5	3812-32-6

RN 816416-70-3 HCAPLUS

CN Germanium lithium nitride oxide sulfate  
(Ge0.5Li2.8N0.3O1.45(SO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
O4S	0.5	14808-79-8
Ge	0.5	7440-56-4
Li	2.8	7439-93-2

RN 816416-72-5 HCAPLUS

CN Aluminum gallium lithium nitride oxide (Al0.5Ga0.5Li2.8N0.3O2.45)

(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
Ga	0.5	7440-55-3
Li	2.8	7439-93-2
Al	0.5	7429-90-5

RN 816416-74-7 HCAPLUS

CN Carbon lithium nitride oxide sulfate (C0.5Li1.8N0.3O0.95(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
O4S	0.5	14808-79-8
C	0.5	7440-44-0
Li	1.8	7439-93-2

RN 882682-64-6 HCAPLUS

CN Lithium silicon nitride oxide (Li1.8SiN0.5O2.15) (9CI) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.5	17778-88-0
O	2.15	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

RN 884739-67-7 HCAPLUS

CN Lithium silicon nitride oxide (Li1.8SiN0.3O2.45) (9CI) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

RN 885122-24-7 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi1.8N0.3O2.45) (9CI) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
Li	1.8	7439-93-2
Al	1	7429-90-5



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
IT 782495-23-2P, Lithium titanium metaphosphate oxide  
(Li<sub>2.8</sub>Ti<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-24-3P, Lithium vanadium metaphosphate  
oxide (Li<sub>2.8</sub>V<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-25-4P, Chromium lithium  
metaphosphate oxide (Cr<sub>0.2</sub>Li<sub>2.8</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-26-5P, Lithium  
manganese metaphosphate oxide (Li<sub>2.8</sub>Mn<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-27-6P,  
Iron lithium metaphosphate oxide (Fe<sub>0.2</sub>Li<sub>2.8</sub>(PO<sub>3</sub>)O<sub>0.9</sub>)  
782495-28-7P, Cobalt lithium metaphosphate oxide  
(Co<sub>0.2</sub>Li<sub>2.8</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-29-8P, Lithium nickel metaphosphate  
oxide (Li<sub>2.8</sub>Ni<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-30-1P, Copper lithium  
metaphosphate oxide (Cu<sub>0.2</sub>Li<sub>2.8</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-31-2P, Lithium  
zirconium metaphosphate oxide (Li<sub>2.8</sub>Zr<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-32-3P,  
Lithium niobium metaphosphate oxide (Li<sub>2.8</sub>Nb<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>)  
782495-33-4P, Lithium molybdenum metaphosphate oxide  
(Li<sub>2.8</sub>Mo<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-34-5P, Lithium ruthenium  
metaphosphate oxide (Li<sub>2.8</sub>Ru<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-35-6P, Lithium  
silver metaphosphate oxide (Li<sub>2.8</sub>Ag<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-36-7P,  
Lithium tantalum metaphosphate oxide (Li<sub>2.8</sub>Ta<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>)  
782495-37-8P, Lithium tungsten metaphosphate oxide  
(Li<sub>2.8</sub>W<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-38-9P, Lithium platinum metaphosphate  
oxide (Li<sub>2.8</sub>Pt<sub>0.2</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-39-0P, Gold lithium  
metaphosphate oxide (Au<sub>0.2</sub>Li<sub>2.8</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-41-4P, Lithium  
tungsten metaphosphate oxide (Li<sub>2.8</sub>W<sub>0.01</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-42-5P,  
Lithium tungsten metaphosphate oxide (Li<sub>2.8</sub>W<sub>0.05</sub>(PO<sub>3</sub>)O<sub>0.9</sub>)  
782495-43-6P, Lithium tungsten metaphosphate oxide  
(Li<sub>2.8</sub>W<sub>0.1</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-44-7P, Lithium tungsten metaphosphate  
oxide (Li<sub>2.8</sub>W<sub>0.5</sub>(PO<sub>3</sub>)O<sub>0.9</sub>) 782495-47-0P, Lithium vanadium oxide  
phosphate (Li<sub>2.8</sub>V<sub>0.2</sub>O<sub>0.4</sub>(PO<sub>4</sub>)) 782495-48-1P, Chromium lithium  
oxide phosphate (Cr<sub>0.2</sub>Li<sub>2.8</sub>O<sub>0.2</sub>(PO<sub>4</sub>)) 782495-49-2P, Lithium  
manganese oxide phosphate (Li<sub>2.8</sub>Mn<sub>0.2</sub>O<sub>0.3</sub>(PO<sub>4</sub>)) 782495-50-5P, Iron  
lithium oxide phosphate (Fe<sub>0.2</sub>Li<sub>2.8</sub>O<sub>0.17</sub>(PO<sub>4</sub>)) 782495-51-6P,  
Cobalt lithium oxide phosphate (Co<sub>0.2</sub>Li<sub>2.8</sub>O<sub>0.17</sub>(PO<sub>4</sub>))  
782495-52-7P, Lithium nickel oxide phosphate (Li<sub>2.8</sub>Ni<sub>0.2</sub>O<sub>0.1</sub>(PO<sub>4</sub>))  
782495-53-8P, Copper lithium oxide phosphate (Cu<sub>0.2</sub>Li<sub>2.8</sub>O<sub>0.1</sub>(PO<sub>4</sub>))  
782495-54-9P, Lithium zirconium oxide phosphate  
(Li<sub>2.8</sub>Zr<sub>0.2</sub>O<sub>0.3</sub>(PO<sub>4</sub>)) 782495-55-0P, Lithium niobium oxide  
phosphate (Li<sub>2.8</sub>Nb<sub>0.2</sub>O<sub>0.4</sub>(PO<sub>4</sub>)) 782495-56-1P, Lithium molybdenum  
oxide phosphate (Li<sub>2.8</sub>Mo<sub>0.2</sub>O<sub>0.5</sub>(PO<sub>4</sub>)) 782495-57-2P, Lithium silver  
phosphate (Li<sub>2.8</sub>Ag<sub>0.2</sub>(PO<sub>4</sub>)) 782495-58-3P, Lithium tantalum oxide  
phosphate (Li<sub>2.8</sub>Ta<sub>0.2</sub>O<sub>0.4</sub>(PO<sub>4</sub>)) 782495-59-4P, Lithium tungsten  
oxide phosphate (Li<sub>2.8</sub>W<sub>0.2</sub>O<sub>0.5</sub>(PO<sub>4</sub>)) 782495-60-7P, Lithium  
titanium oxide phosphate (Li<sub>4</sub>Ti<sub>0.25</sub>O(PO<sub>4</sub>)) 782495-61-8P, Lithium  
vanadium oxide phosphate (Li<sub>3.75</sub>V<sub>0.25</sub>O(PO<sub>4</sub>)) 782495-62-9P,  
Chromium lithium oxide phosphate (Cr<sub>0.25</sub>Li<sub>3.5</sub>O(PO<sub>4</sub>)) 782495-63-0P,  
Lithium manganese oxide phosphate (Li<sub>3.25</sub>Mn<sub>0.25</sub>O(PO<sub>4</sub>))  
782495-64-1P, Lithium niobium oxide phosphate (Li<sub>3.75</sub>Nb<sub>0.25</sub>O(PO<sub>4</sub>))  
782495-65-2P, Lithium molybdenum oxide phosphate (Li<sub>3.5</sub>Mo<sub>0.25</sub>O(PO<sub>4</sub>))  
782495-66-3P, Lithium tantalum oxide phosphate (Li<sub>3.75</sub>Ta<sub>0.25</sub>O(PO<sub>4</sub>))  
782495-67-4P, Lithium tungsten oxide phosphate (Li<sub>3.5</sub>W<sub>0.25</sub>O(PO<sub>4</sub>))  
782495-69-6P, Lithium tungsten oxide phosphate  
(Li<sub>3.02</sub>W<sub>0.01</sub>O<sub>0.04</sub>(PO<sub>4</sub>)) 782495-70-9P, Lithium tungsten oxide  
phosphate (Li<sub>3.2</sub>W<sub>0.1</sub>O<sub>0.4</sub>(PO<sub>4</sub>)) 782495-72-1P, Lithium tungsten  
oxide phosphate (Li<sub>3.66</sub>W<sub>0.33</sub>O<sub>1.32</sub>(PO<sub>4</sub>)) 782495-74-3P, Lithium  
tungsten oxide phosphate (Li<sub>5</sub>W<sub>0.4</sub>O(PO<sub>4</sub>)) 782495-76-5P, Lithium  
tungsten oxide phosphate (Li<sub>7</sub>W<sub>2</sub>O<sub>8</sub>(PO<sub>4</sub>)) 816415-85-7P,  
Boron lithium nitride oxide (BLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) 816416-34-9P  
, Germanium lithium nitride oxide (GeLi<sub>1.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>)  
816416-38-3P, Aluminum lithium nitride oxide  
(AlLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) 816416-40-7P, Aluminum lithium nitride  
oxide (AlLi<sub>4.8</sub>N<sub>0.3</sub>O<sub>3.45</sub>) 816416-44-1P, Gallium lithium

nitride oxide ( $\text{GaLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ ) 816416-46-3P, Lithium sulfur nitride oxide ( $\text{Li}_{1.8}\text{S}_{0.3}\text{N}_{0.3}\text{O}_{3.45}$ ) 816416-50-9P, Boron lithium nitride oxide silicate ( $\text{B}_{0.5}\text{Li}_{2.3}\text{N}_{0.3}\text{O}_{0.45}(\text{SiO}_4)_{0.5}$ ) 816416-52-1P, Germanium lithium nitride oxide silicate ( $\text{Ge}_{0.5}\text{Li}_{3.8}\text{N}_{0.3}\text{O}_{1.45}(\text{SiO}_4)_{0.5}$ ) 816416-54-3P, Carbon lithium nitride oxide silicate ( $\text{C}_{0.5}\text{Li}_{2.8}\text{N}_{0.3}\text{O}_{2.95}(\text{SiO}_4)_{0.5}$ ) 816416-56-5P, Lithium silicon nitride oxide sulfate ( $\text{Li}_{2.8}\text{Si}_{0.5}\text{N}_{0.3}\text{O}_{1.45}(\text{SO}_4)_{0.5}$ ) 816416-58-7P, Germanium lithium borate nitride oxide ( $\text{Ge}_{0.5}\text{Li}_{2.3}(\text{BO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.95}$ ) 816416-60-1P, Aluminum lithium borate nitride oxide ( $\text{Al}_{0.5}\text{Li}_{2.8}(\text{BO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.95}$ ) 816416-62-3P, Boron lithium carbonate nitride oxide ( $\text{B}_{0.5}\text{Li}_{1.3}(\text{CO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.45}$ ) 816416-64-5P, Gallium lithium borate nitride oxide ( $\text{Ga}_{0.5}\text{Li}_{0.8}(\text{BO}_2)_{0.5}\text{N}_{0.3}\text{O}_{0.45}$ ) 816416-66-7P, Boron lithium nitride oxide sulfate ( $\text{B}_{0.5}\text{Li}_{1.3}\text{N}_{0.3}\text{O}_{0.45}(\text{SO}_4)_{0.5}$ ) 816416-68-9P 816416-70-3P, Germanium lithium nitride oxide sulfate ( $\text{Ge}_{0.5}\text{Li}_{2.8}\text{N}_{0.3}\text{O}_{1.45}(\text{SO}_4)_{0.5}$ ) 816416-72-5P, Aluminum gallium lithium nitride oxide ( $\text{Al}_{0.5}\text{Ga}_{0.5}\text{Li}_{2.8}\text{N}_{0.3}\text{O}_{2.45}$ ) 816416-74-7P, Carbon lithium nitride oxide sulfate ( $\text{C}_{0.5}\text{Li}_{1.8}\text{N}_{0.3}\text{O}_{0.95}(\text{SO}_4)_{0.5}$ ) 882681-95-0P, Lithium titanium oxide phosphate ( $\text{Li}_{2.8}\text{Ti}_{0.2}\text{O}_{0.3}(\text{PO}_4)$ ) 882682-19-1P, Lithium zirconium oxide phosphate ( $\text{Li}_{4}\text{Zr}_{0.25}\text{O}(\text{PO}_4)$ ) 882682-64-6P, Lithium silicon nitride oxide ( $\text{Li}_{1.8}\text{Si}_{0.5}\text{O}_{2.15}$ ) 884739-67-7P, Lithium silicon nitride oxide ( $\text{Li}_{1.8}\text{Si}_{0.3}\text{O}_{2.45}$ ) 885122-24-7P, Aluminum lithium nitride oxide ( $\text{AlLi}_{1.8}\text{N}_{0.3}\text{O}_{2.45}$ )

RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation)

(anodes; manufacture of lithium secondary batteries having wet-stable oxide or nitride-based ionic conductors)

L16 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2006:384961 HCAPLUS

DOCUMENT NUMBER: 144:436091

TITLE: Lithium battery anode with inorg. compound.  
layer formed on active material layer

INVENTOR(S): Ugaji, Masaya; Mino, Shinji; Shibano, Yasuyuki;  
Ito, Shuji

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: PCT Int. Appl., 32 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2006043470	A1	20060427	WO 2005-JP18917	200510 14

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,  
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM,  
KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK,  
MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO,  
RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ,  
UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,  
 IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR,  
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,  
 TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
 ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 EP 1677375 A1 20060705 EP 2005-793190

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 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
 PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU,  
 PL, SK, BA, HR, IS, YU  
 CN 1860628 A 20061108 CN 2005-80001076

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 US 2007020520 A1 20070125 US 2006-575889

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 PRIORITY APPLN. INFO.: JP 2004-306649 A

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 WO 2005-JP18917 W

200510  
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AB Disclosed is a neg. electrode for batteries which comprises a collector, an active material layer and an inorg. compound. layer. The active material layer is formed on the collector, and the inorg. compound. layer is formed on the surface of the active material layer. The general formula of the inorg. compound. layer is expressed as  $\text{Li}_x\text{PTyOz}$  or  $\text{Li}_x\text{MOyNz}$ . The compound. constituting the inorg. compound. layer has lithium ion conductivity and excellent moisture resistance.

IT 816415-85-7, Boron lithium nitride oxide ( $\text{BLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ )  
 816416-34-9, Germanium lithium nitride oxide  
 ( $\text{GeLi}_{1.8}\text{N}_{0.3}\text{O}_{2.45}$ ) 816416-38-3, Aluminum lithium nitride  
 oxide ( $\text{AlLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ ) 816416-40-7, Aluminum lithium  
 nitride oxide ( $\text{AlLi}_{4.8}\text{N}_{0.3}\text{O}_{3.45}$ ) 816416-42-9, Carbon  
 lithium nitride oxide ( $\text{CLi}_{1.8}\text{N}_{0.3}\text{O}_{2.45}$ ) 816416-44-1,  
 Gallium lithium nitride oxide ( $\text{GaLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ ) 816416-46-3  
 , Lithium sulfur nitride oxide ( $\text{Li}_{1.8}\text{S}\text{N}_{0.3}\text{O}_{3.45}$ ) 816416-50-9  
 , Boron lithium nitride oxide silicate ( $\text{B}_{0.5}\text{Li}_{2.3}\text{N}_{0.3}\text{O}_{0.45}(\text{SiO}_4)_{0.5}$ )  
 816416-52-1, Germanium lithium nitride oxide silicate  
 ( $\text{Ge}_{0.5}\text{Li}_{3.8}\text{N}_{0.3}\text{O}_{1.45}(\text{SiO}_4)_{0.5}$ ) 816416-54-3, Carbon lithium  
 nitride oxide silicate ( $\text{C}_{0.5}\text{Li}_{2.8}\text{N}_{0.3}\text{O}_{2.95}(\text{SiO}_4)_{0.5}$ )  
 816416-56-5, Lithium silicon nitride oxide sulfate  
 ( $\text{Li}_{2.8}\text{Si}_{0.5}\text{N}_{0.3}\text{O}_{1.45}(\text{SO}_4)_{0.5}$ ) 816416-58-7, Germanium  
 lithium borate nitride oxide ( $\text{Ge}_{0.5}\text{Li}_{2.3}(\text{BO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.95}$ )  
 816416-60-1, Aluminum lithium borate nitride oxide  
 ( $\text{Al}_{0.5}\text{Li}_{2.8}(\text{BO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.95}$ ) 816416-62-3, Boron lithium  
 carbonate nitride oxide ( $\text{B}_{0.5}\text{Li}_{1.3}(\text{CO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.45}$ )  
 816416-64-5, Gallium lithium borate nitride oxide  
 ( $\text{Ga}_{0.5}\text{Li}_{0.8}(\text{BO}_2)_{0.5}\text{N}_{0.3}\text{O}_{0.45}$ ) 816416-66-7, Boron lithium  
 nitride oxide sulfate ( $\text{B}_{0.5}\text{Li}_{1.3}\text{N}_{0.3}\text{O}_{0.45}(\text{SO}_4)_{0.5}$ )  
 816416-68-9 816416-70-3, Germanium lithium nitride  
 oxide sulfate ( $\text{Ge}_{0.5}\text{Li}_{2.8}\text{N}_{0.3}\text{O}_{1.45}(\text{SO}_4)_{0.5}$ ) 816416-74-7,  
 Carbon lithium nitride oxide sulfate ( $\text{C}_{0.5}\text{Li}_{1.8}\text{N}_{0.3}\text{O}_{0.95}(\text{SO}_4)_{0.5}$ )

882682-64-6, Lithium silicon nitride oxide  
(Li<sub>1.8</sub>SiN<sub>0.5</sub>O<sub>2.15</sub>) 884739-67-7, Lithium silicon nitride  
oxide (Li<sub>1.8</sub>SiN<sub>0.3</sub>O<sub>2.45</sub>)

RL: TEM (Technical or engineered material use); USES (Uses)  
(inorg. compound. layer for lithium battery)

RN 816415-85-7 HCAPLUS

CN Boron lithium nitride oxide (BLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
B	1	7440-42-8
Li	0.8	7439-93-2

RN 816416-34-9 HCAPLUS

CN Germanium lithium nitride oxide (GeLi<sub>1.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
Ge	1	7440-56-4
Li	1.8	7439-93-2

RN 816416-38-3 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
Li	0.8	7439-93-2
Al	1	7429-90-5

RN 816416-40-7 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi<sub>4.8</sub>N<sub>0.3</sub>O<sub>3.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	3.45	17778-80-2
Li	4.8	7439-93-2
Al	1	7429-90-5

RN 816416-42-9 HCAPLUS

CN Carbon lithium nitride oxide (CLi<sub>1.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
C	1	7440-44-0
Li	1.8	7439-93-2

RN 816416-44-1 HCAPLUS

CN Gallium lithium nitride oxide (GaLi0.8N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
Ga	1	7440-55-3
Li	0.8	7439-93-2

RN 816416-46-3 HCAPLUS

CN Lithium sulfur nitride oxide (Li1.8SN0.3O3.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	3.45	17778-80-2
S	1	7704-34-9
Li	1.8	7439-93-2

RN 816416-50-9 HCAPLUS

CN Boron lithium nitride oxide silicate (B0.5Li2.3N0.3O0.45(SiO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.45	17778-80-2
O4Si	0.5	17181-37-2
B	0.5	7440-42-8
Li	2.3	7439-93-2

RN 816416-52-1 HCAPLUS

CN Germanium lithium nitride oxide silicate  
(Ge0.5Li3.8N0.3O1.45(SiO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
O4Si	0.5	17181-37-2
Ge	0.5	7440-56-4
Li	3.8	7439-93-2

RN 816416-54-3 HCAPLUS

CN Carbon lithium nitride oxide silicate (C0.5Li2.8N0.3O2.95(SiO4)0.5)  
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
O4Si	0.5	17181-37-2
C	0.5	7440-44-0
Li	2.8	7439-93-2

RN 816416-56-5 HCAPLUS

CN Lithium silicon nitride oxide sulfate ( $\text{Li}_{2.8}\text{Si}_{0.5}\text{N}_{0.3}\text{O}_{1.45}(\text{SO}_4)_{0.5}$ )  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
O4S	0.5	14808-79-8
Si	0.5	7440-21-3
Li	2.8	7439-93-2

RN 816416-58-7 HCAPLUS

CN Germanium lithium borate nitride oxide ( $\text{Ge}_{0.5}\text{Li}_{2.3}(\text{BO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.95}$ )  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Ge	0.5	7440-56-4
Li	2.3	7439-93-2

RN 816416-60-1 HCAPLUS

CN Aluminum lithium borate nitride oxide ( $\text{Al}_{0.5}\text{Li}_{2.8}(\text{BO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.95}$ )  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Li	2.8	7439-93-2
Al	0.5	7429-90-5

RN 816416-62-3 HCAPLUS

CN Boron lithium carbonate nitride oxide ( $\text{B}_{0.5}\text{Li}_{1.3}(\text{CO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.45}$ )  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
B	0.5	7440-42-8
Li	1.3	7439-93-2
CO3	0.5	3812-32-6

RN 816416-64-5 HCAPLUS

CN Gallium lithium borate nitride oxide ( $\text{Ga}_{0.5}\text{Li}_{0.8}(\text{BO}_2)_{0.5}\text{N}_{0.3}\text{O}_{0.45}$ )  
(CA INDEX NAME)

Component	Ratio	Component Registry Number

N	0.3	17778-88-0
O	0.45	17778-80-2
BO2	0.5	14100-65-3
Ga	0.5	7440-55-3
Li	0.8	7439-93-2

RN 816416-66-7 HCAPLUS

CN Boron lithium nitride oxide sulfate (B0.5Li1.3N0.3O0.45(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
O4S	0.5	14808-79-8
B	0.5	7440-42-8
Li	1.3	7439-93-2

RN 816416-68-9 HCAPLUS

CN Germanium lithium carbonate nitride oxide  
(Ge0.5Li2.8(CO3)0.5N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
Ge	0.5	7440-56-4
Li	2.8	7439-93-2
CO3	0.5	3812-32-6

RN 816416-70-3 HCAPLUS

CN Germanium lithium nitride oxide sulfate  
(Ge0.5Li2.8N0.3O1.45(SO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
O4S	0.5	14808-79-8
Ge	0.5	7440-56-4
Li	2.8	7439-93-2

RN 816416-74-7 HCAPLUS

CN Carbon lithium nitride oxide sulfate (C0.5Li1.8N0.3O0.95(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.95	17778-80-2
O4S	0.5	14808-79-8
C	0.5	7440-44-0
Li	1.8	7439-93-2

RN 882682-64-6 HCAPLUS

CN Lithium silicon nitride oxide (Li1.8SiN0.5O2.15) (9CI) (CA INDEX

NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.5	17778-88-0
O	2.15	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

RN 884739-67-7 HCAPLUS

CN Lithium silicon nitride oxide (Li<sub>1.8</sub>SiN<sub>0.302.45</sub>) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 782495-53-8, Copper lithium oxide phosphate (Cu<sub>0.2</sub>Li<sub>2.8</sub>O<sub>0.1</sub>(PO<sub>4</sub>))  
 782495-54-9, Lithium zirconium oxide phosphate (Li<sub>2.8</sub>Zr<sub>0.2</sub>O<sub>0.3</sub>(PO<sub>4</sub>))  
 782495-56-1, Lithium molybdenum oxide phosphate  
 (Li<sub>2.8</sub>Mo<sub>0.2</sub>O<sub>0.5</sub>(PO<sub>4</sub>)) 782495-58-3, Lithium tantalum oxide  
 phosphate (Li<sub>2.8</sub>Ta<sub>0.2</sub>O<sub>0.4</sub>(PO<sub>4</sub>)) 782495-59-4, Lithium tungsten  
 oxide phosphate (Li<sub>2.8</sub>W<sub>0.2</sub>O<sub>0.5</sub>(PO<sub>4</sub>)) 782495-60-7, Lithium titanium  
 oxide phosphate (Li<sub>4</sub>Ti<sub>0.25</sub>O(PO<sub>4</sub>)) 782495-65-2, Lithium molybdenum  
 oxide phosphate (Li<sub>3.5</sub>Mo<sub>0.25</sub>O(PO<sub>4</sub>)) 782495-66-3, Lithium tantalum  
 oxide phosphate (Li<sub>3.75</sub>Ta<sub>0.25</sub>O(PO<sub>4</sub>)) 782495-67-4, Lithium tungsten  
 oxide phosphate (Li<sub>3.5</sub>W<sub>0.25</sub>O(PO<sub>4</sub>)) 782495-69-6, Lithium tungsten  
 oxide phosphate (Li<sub>3.02</sub>W<sub>0.0100.04</sub>(PO<sub>4</sub>)) 782495-70-9, Lithium  
 tungsten oxide phosphate (Li<sub>3.2</sub>W<sub>0.100.4</sub>(PO<sub>4</sub>)) 782495-72-1, Lithium  
 tungsten oxide phosphate (Li<sub>3.66</sub>W<sub>0.3301.32</sub>(PO<sub>4</sub>)) 782495-74-3,  
 Lithium tungsten oxide phosphate (Li<sub>5</sub>W<sub>0.4</sub>(PO<sub>4</sub>)) 782495-76-5,  
 Lithium tungsten oxide phosphate (Li<sub>7</sub>W<sub>2.08</sub>(PO<sub>4</sub>)) 816415-85-7  
 , Boron lithium nitride oxide (BLi<sub>0.8</sub>N<sub>0.301.45</sub>) 816416-34-9  
 , Germanium lithium nitride oxide (GeLi<sub>1.8</sub>N<sub>0.302.45</sub>)  
 816416-38-3, Aluminum lithium nitride oxide  
 (AlLi<sub>0.8</sub>N<sub>0.301.45</sub>) 816416-40-7, Aluminum lithium nitride  
 oxide (AlLi<sub>4.8</sub>N<sub>0.303.45</sub>) 816416-42-9, Carbon lithium  
 nitride oxide (CLi<sub>1.8</sub>N<sub>0.302.45</sub>) 816416-44-1, Gallium  
 lithium nitride oxide (GaLi<sub>0.8</sub>N<sub>0.301.45</sub>) 816416-46-3,  
 Lithium sulfur nitride oxide (Li<sub>1.8</sub>S<sub>0.303.45</sub>) 816416-50-9  
 , Boron lithium nitride oxide silicate (B<sub>0.5</sub>Li<sub>2.3</sub>N<sub>0.300.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
 816416-52-1, Germanium lithium nitride oxide silicate  
 (Ge<sub>0.5</sub>Li<sub>3.8</sub>N<sub>0.301.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>) 816416-54-3, Carbon lithium  
 nitride oxide silicate (C<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.302.95</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
 816416-56-5, Lithium silicon nitride oxide sulfate  
 (Li<sub>2.8</sub>Si<sub>0.5</sub>N<sub>0.301.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>) 816416-58-7, Germanium  
 lithium borate nitride oxide (Ge<sub>0.5</sub>Li<sub>2.3</sub>(BO<sub>3</sub>)<sub>0.5</sub>N<sub>0.300.95</sub>)  
 816416-60-1, Aluminum lithium borate nitride oxide  
 (Al<sub>0.5</sub>Li<sub>2.8</sub>(BO<sub>3</sub>)<sub>0.5</sub>N<sub>0.300.95</sub>) 816416-62-3, Boron lithium  
 carbonate nitride oxide (B<sub>0.5</sub>Li<sub>1.3</sub>(CO<sub>3</sub>)<sub>0.5</sub>N<sub>0.300.45</sub>)  
 816416-64-5, Gallium lithium borate nitride oxide  
 (Ga<sub>0.5</sub>Li<sub>0.8</sub>(BO<sub>2</sub>)<sub>0.5</sub>N<sub>0.300.45</sub>) 816416-66-7, Boron lithium  
 nitride oxide sulfate (B<sub>0.5</sub>Li<sub>1.3</sub>N<sub>0.300.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>)  
 816416-68-9 816416-70-3, Germanium lithium nitride



oxide sulfate ( $\text{Ge}_{0.5}\text{Li}_{2.8}\text{N}_{0.3}\text{O}_{1.45}(\text{SO}_4)_{0.5}$ ) 816416-74-7,  
 Carbon lithium nitride oxide sulfate ( $\text{C}_{0.5}\text{Li}_{1.8}\text{N}_{0.3}\text{O}_{0.95}(\text{SO}_4)_{0.5}$ )  
 882681-95-0, Lithium titanium oxide phosphate ( $\text{Li}_{2.8}\text{Ti}_{0.2}\text{O}_{0.3}(\text{PO}_4)$ )  
 882682-19-1, Lithium zirconium oxide phosphate ( $\text{Li}_4\text{Zr}_{0.25}\text{O}(\text{PO}_4)$ )  
 882682-64-6, Lithium silicon nitride oxide  
 ( $\text{Li}_{1.8}\text{Si}_{0.5}\text{O}_{2.15}$ ) 884739-67-7, Lithium silicon nitride  
 oxide ( $\text{Li}_{1.8}\text{Si}_{0.3}\text{O}_{2.45}$ )

RL: TEM (Technical or engineered material use); USES (Uses)  
 (inorg. compound. layer for lithium battery)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L16 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2006:340654 HCAPLUS

DOCUMENT NUMBER: 144:394643

TITLE: Lithium anode with lithium mixed oxide  
 protective coating for secondary lithium battery  
 INVENTOR(S): Ukaji, Masaya; Mino, Shinji; Shibano, Yasuyuki;  
 Ito, Shuji

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006100083	A	20060413	JP 2004-283846	20040929

PRIORITY APPLN. INFO.: JP 2004-283846

20040929

AB The anode comprises a Li or a Li alloy anode coated with (1) a pretreatment layer containing a Li ion conductive substance and (2) a protective layer comprising  $\text{Li}_x\text{PTyO}_z$  ( $T = \text{Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zr, Nb, Mo, Ru, Ag, Ta, W, Pt, and/or Au}$ ;  $x = 2.0-7.0$ ;  $y = 0.01-1.0$ ;  $z = 3.5-8.0$ ) or  $\text{Li}_x\text{MO}_y\text{N}_z$  [ $M = \text{Si, B, Ge, Al, C, Ga, and/or S}$ ; (a)  $x = 0.6-1.0$ ,  $y = 1.05-1.99$ ,  $z = 0.01-0.5$ , (b)  $x = 1.6-2.0$ ,  $y = 2.05-2.99$ ,  $z = 0.01-0.5$ , (c)  $x = 1.6-2.0$ ,  $y = 3.05-3.99$ ,  $z = 0.01-0.5$ , or (d)  $x = 4.6-5.0$ ,  $y = 3.05-3.99$ ,  $z = 0.01-0.5$ ]. Secondary lithium battery equipped with the anode is also claimed. Since the protective layer has high stability to water and ion conductivity, deterioration of the anode is prevented, and the battery has excellent cycling performance.

IT 816415-85-7, Boron lithium nitride oxide ( $\text{BLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ )  
 816416-34-9, Germanium lithium nitride oxide  
 ( $\text{GeLi}_{1.8}\text{N}_{0.3}\text{O}_{2.45}$ ) 816416-38-3, Aluminum lithium nitride  
 oxide ( $\text{ALi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ ) 816416-40-7, Aluminum lithium  
 nitride oxide ( $\text{ALi}_{4.8}\text{N}_{0.3}\text{O}_{3.45}$ ) 816416-42-9, Carbon  
 lithium nitride oxide ( $\text{CLi}_{1.8}\text{N}_{0.3}\text{O}_{2.45}$ ) 816416-44-1,  
 Gallium lithium nitride oxide ( $\text{GaLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ ) 816416-46-3  
 , Lithium sulfur nitride oxide ( $\text{Li}_{1.8}\text{S}_{0.3}\text{O}_{3.45}$ ) 816416-50-9  
 , Boron lithium nitride oxide silicate ( $\text{B}_{0.5}\text{Li}_{2.3}\text{N}_{0.3}\text{O}_{0.45}(\text{SiO}_4)_{0.5}$ )

816416-52-1, Germanium lithium nitride oxide silicate  
 (Ge0.5Li3.8N0.3O1.45(SiO4)0.5) 816416-54-3, Carbon lithium  
 nitride oxide silicate (C0.5Li2.8N0.3O2.95(SiO4)0.5)  
 816416-56-5, Lithium silicon nitride oxide sulfate  
 (Li2.8Si0.5N0.3O1.45(SO4)0.5) 816416-58-7, Germanium  
 lithium borate nitride oxide (Ge0.5Li2.3(BO3)0.5N0.3O0.95)  
 816416-60-1, Aluminum lithium borate nitride oxide  
 (Al0.5Li2.8(BO3)0.5N0.3O0.95) 816416-62-3, Boron lithium  
 carbonate nitride oxide (B0.5Li1.3(CO3)0.5N0.3O0.45)  
 816416-64-5, Gallium lithium borate nitride oxide  
 (Ga0.5Li0.8(BO2)0.5N0.3O0.45) 816416-66-7, Boron lithium  
 nitride oxide sulfate (B0.5Li1.3N0.3O0.45(SO4)0.5)  
 816416-68-9 816416-70-3, Germanium lithium nitride  
 oxide sulfate (Ge0.5Li2.8N0.3O1.45(SO4)0.5) 816416-74-7,  
 Carbon lithium nitride oxide sulfate (C0.5Li1.8N0.3O0.95(SO4)0.5)  
 882682-60-2, Aluminum gallium lithium nitride oxide  
 (Al0.5Ga0.5Li2.8N0.3O3.45) 882682-64-6, Lithium silicon  
 nitride oxide (Li1.8SiN0.5O2.15) 884739-67-7, Lithium  
 silicon nitride oxide (Li1.8SiN0.3O2.45)  
 RL: DEV (Device component use); PEP (Physical, engineering or  
 chemical process); PYP (Physical process); PROC (Process)  
 (protective coating; anode having lithium mixed oxide protective  
 coating with high water resistance and ion conductivity on pretreatment  
 coating for Li battery)

RN 816415-85-7 HCAPLUS

CN Boron lithium nitride oxide (BLi0.8N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
B	1	7440-42-8
Li	0.8	7439-93-2

RN 816416-34-9 HCAPLUS

CN Germanium lithium nitride oxide (GeLi1.8N0.3O2.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
Ge	1	7440-56-4
Li	1.8	7439-93-2

RN 816416-38-3 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi0.8N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
Li	0.8	7439-93-2
Al	1	7429-90-5

RN 816416-40-7 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi4.8N0.3O3.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	3.45	17778-80-2
Li	4.8	7439-93-2
Al	1	7429-90-5

RN 816416-42-9 HCAPLUS

CN Carbon lithium nitride oxide (CLi1.8N0.3O2.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
C	1	7440-44-0
Li	1.8	7439-93-2

RN 816416-44-1 HCAPLUS

CN Gallium lithium nitride oxide (GaLi0.8N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
Ga	1	7440-55-3
Li	0.8	7439-93-2

RN 816416-46-3 HCAPLUS

CN Lithium sulfur nitride oxide (Li1.8SN0.3O3.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	3.45	17778-80-2
S	1	7704-34-9
Li	1.8	7439-93-2

RN 816416-50-9 HCAPLUS

CN Boron lithium nitride oxide silicate (B0.5Li2.3N0.3O0.45(SiO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.45	17778-80-2
O4Si	0.5	17181-37-2
B	0.5	7440-42-8
Li	2.3	7439-93-2

RN 816416-52-1 HCAPLUS

CN Germanium lithium nitride oxide silicate  
(Ge0.5Li3.8N0.3O1.45(SiO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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N	0.3	17778-88-0
O	1.45	17778-80-2
O4Si	0.5	17181-37-2
Ge	0.5	7440-56-4
Li	3.8	7439-93-2

RN 816416-54-3 HCAPLUS

CN Carbon lithium nitride oxide silicate (C0.5Li2.8N0.3O2.95(SiO4)0.5)  
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.95	17778-80-2
O4Si	0.5	17181-37-2
C	0.5	7440-44-0
Li	2.8	7439-93-2

RN 816416-56-5 HCAPLUS

CN Lithium silicon nitride oxide sulfate (Li2.8Si0.5N0.3O1.45(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
O4S	0.5	14808-79-8
Si	0.5	7440-21-3
Li	2.8	7439-93-2

RN 816416-58-7 HCAPLUS

CN Germanium lithium borate nitride oxide (Ge0.5Li2.3(BO3)0.5N0.3O0.95)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Ge	0.5	7440-56-4
Li	2.3	7439-93-2

RN 816416-60-1 HCAPLUS

CN Aluminum lithium borate nitride oxide (Al0.5Li2.8(BO3)0.5N0.3O0.95)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Li	2.8	7439-93-2
Al	0.5	7429-90-5

RN 816416-62-3 HCAPLUS

CN Boron lithium carbonate nitride oxide (B0.5Li1.3(CO3)0.5N0.3O0.45)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
B	0.5	7440-42-8
Li	1.3	7439-93-2
CO3	0.5	3812-32-6

RN 816416-64-5 HCAPLUS

CN Gallium lithium borate nitride oxide (Ga0.5Li0.8(BO2)0.5N0.3O0.45)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
BO2	0.5	14100-65-3
Ga	0.5	7440-55-3
Li	0.8	7439-93-2

RN 816416-66-7 HCAPLUS

CN Boron lithium nitride oxide sulfate (B0.5Li1.3N0.3O0.45(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
O4S	0.5	14808-79-8
B	0.5	7440-42-8
Li	1.3	7439-93-2

RN 816416-68-9 HCAPLUS

CN Germanium lithium carbonate nitride oxide  
(Ge0.5Li2.8(CO3)0.5N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
Ge	0.5	7440-56-4
Li	2.8	7439-93-2
CO3	0.5	3812-32-6

RN 816416-70-3 HCAPLUS

CN Germanium lithium nitride oxide sulfate  
(Ge0.5Li2.8N0.3O1.45(SO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2

O4S	0.5	14808-79-8
Ge	0.5	7440-56-4
Li	2.8	7439-93-2

RN 816416-74-7 HCAPLUS

CN Carbon lithium nitride oxide sulfate (C0.5Li1.8N0.3O0.95(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
O4S	0.5	14808-79-8
C	0.5	7440-44-0
Li	1.8	7439-93-2

RN 882682-60-2 HCAPLUS

CN Aluminum gallium lithium nitride oxide (Al0.5Ga0.5Li2.8N0.3O3.45)  
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	3.45	17778-80-2
Ga	0.5	7440-55-3
Li	2.8	7439-93-2
Al	0.5	7429-90-5

RN 882682-64-6 HCAPLUS

CN Lithium silicon nitride oxide (Li1.8SiN0.5O2.15) (9CI) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.5	17778-88-0
O	2.15	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

RN 884739-67-7 HCAPLUS

CN Lithium silicon nitride oxide (Li1.8SiN0.3O2.45) (9CI) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
Si	1	7440-21-3
Li	1.8	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 782495-23-2, Lithium titanium metaphosphate oxide  
(Li2.8Ti0.2(PO3)O0.9) 782495-24-3, Lithium vanadium metaphosphate  
oxide (Li2.8V0.2(PO3)O0.9) 782495-25-4, Chromium lithium  
metaphosphate oxide (Cr0.2Li2.8(PO3)O0.9) 782495-26-5, Lithium  
manganese metaphosphate oxide (Li2.8Mn0.2(PO3)O0.9) 782495-27-6,

Iron lithium metaphosphate oxide ( $\text{Fe}_0.2\text{Li}_{2.8}(\text{PO}_3)\text{O}_0.9$ )  
 782495-28-7, Cobalt lithium metaphosphate oxide  
 ( $\text{Co}_0.2\text{Li}_{2.8}(\text{PO}_3)\text{O}_0.9$ ) 782495-29-8, Lithium nickel metaphosphate  
 oxide ( $\text{Li}_{2.8}\text{Ni}_0.2(\text{PO}_3)\text{O}_0.9$ ) 782495-30-1, Copper lithium  
 metaphosphate oxide ( $\text{Cu}_0.2\text{Li}_{2.8}(\text{PO}_3)\text{O}_0.9$ ) 782495-31-2, Lithium  
 zirconium metaphosphate oxide ( $\text{Li}_{2.8}\text{Zr}_0.2(\text{PO}_3)\text{O}_0.9$ ) 782495-32-3,  
 Lithium niobium metaphosphate oxide ( $\text{Li}_{2.8}\text{Nb}_0.2(\text{PO}_3)\text{O}_0.9$ )  
 782495-33-4, Lithium molybdenum metaphosphate oxide  
 ( $\text{Li}_{2.8}\text{Mo}_0.2(\text{PO}_3)\text{O}_0.9$ ) 782495-34-5, Lithium ruthenium metaphosphate  
 oxide ( $\text{Li}_{2.8}\text{Ru}_0.2(\text{PO}_3)\text{O}_0.9$ ) 782495-35-6, Lithium silver  
 metaphosphate oxide ( $\text{Li}_{2.8}\text{Ag}_0.2(\text{PO}_3)\text{O}_0.9$ ) 782495-36-7, Lithium  
 tantalum metaphosphate oxide ( $\text{Li}_{2.8}\text{Ta}_0.2(\text{PO}_3)\text{O}_0.9$ ) 782495-38-9,  
 Lithium platinum metaphosphate oxide ( $\text{Li}_{2.8}\text{Pt}_0.2(\text{PO}_3)\text{O}_0.9$ )  
 782495-39-0, Gold lithium metaphosphate oxide ( $\text{Au}_0.2\text{Li}_{2.8}(\text{PO}_3)\text{O}_0.9$ )  
 782495-41-4, Lithium tungsten metaphosphate oxide  
 ( $\text{Li}_{2.8}\text{W}_0.01(\text{PO}_3)\text{O}_0.9$ ) 782495-42-5, Lithium tungsten metaphosphate  
 oxide ( $\text{Li}_{2.8}\text{W}_0.05(\text{PO}_3)\text{O}_0.9$ ) 782495-43-6, Lithium tungsten  
 metaphosphate oxide ( $\text{Li}_{2.8}\text{W}_0.1(\text{PO}_3)\text{O}_0.9$ ) 782495-44-7, Lithium  
 tungsten metaphosphate oxide ( $\text{Li}_{2.8}\text{W}_0.5(\text{PO}_3)\text{O}_0.9$ ) 782495-47-0,  
 Lithium vanadium oxide phosphate ( $\text{Li}_{2.8}\text{V}_0.2\text{O}_0.4(\text{PO}_4)$ ) 782495-48-1,  
 Chromium lithium oxide phosphate ( $\text{Cr}_0.2\text{Li}_{2.8}\text{O}_0.2(\text{PO}_4)$ )  
 782495-49-2, Lithium manganese oxide phosphate ( $\text{Li}_{2.8}\text{Mn}_0.2\text{O}_0.3(\text{PO}_4)$ )  
 782495-50-5, Iron lithium oxide phosphate ( $\text{Fe}_0.2\text{Li}_{2.8}\text{O}_0.17(\text{PO}_4)$ )  
 782495-51-6, Cobalt lithium oxide phosphate ( $\text{Co}_0.2\text{Li}_{2.8}\text{O}_0.17(\text{PO}_4)$ )  
 782495-52-7, Lithium nickel oxide phosphate ( $\text{Li}_{2.8}\text{Ni}_0.2\text{O}_0.1(\text{PO}_4)$ )  
 782495-53-8, Copper lithium oxide phosphate ( $\text{Cu}_0.2\text{Li}_{2.8}\text{O}_0.1(\text{PO}_4)$ )  
 782495-54-9, Lithium zirconium oxide phosphate ( $\text{Li}_{2.8}\text{Zr}_0.2\text{O}_0.3(\text{PO}_4)$ )  
 782495-55-0, Lithium niobium oxide phosphate ( $\text{Li}_{2.8}\text{Nb}_0.2\text{O}_0.4(\text{PO}_4)$ )  
 782495-56-1, Lithium molybdenum oxide phosphate  
 ( $\text{Li}_{2.8}\text{Mo}_0.2\text{O}_0.5(\text{PO}_4)$ ) 782495-57-2, Lithium silver phosphate  
 ( $\text{Li}_{2.8}\text{Ag}_0.2(\text{PO}_4)$ ) 782495-58-3, Lithium tantalum oxide phosphate  
 ( $\text{Li}_{2.8}\text{Ta}_0.2\text{O}_0.4(\text{PO}_4)$ ) 782495-59-4, Lithium tungsten oxide  
 phosphate ( $\text{Li}_{2.8}\text{W}_0.2\text{O}_0.5(\text{PO}_4)$ ) 782495-60-7, Lithium titanium oxide  
 phosphate ( $\text{Li}_4\text{Ti}_0.25\text{O}(\text{PO}_4)$ ) 782495-61-8, Lithium vanadium oxide  
 phosphate ( $\text{Li}_3.75\text{V}_0.25\text{O}(\text{PO}_4)$ ) 782495-62-9, Chromium lithium oxide  
 phosphate ( $\text{Cr}_0.25\text{Li}_3.5\text{O}(\text{PO}_4)$ ) 782495-63-0, Lithium manganese oxide  
 phosphate ( $\text{Li}_3.25\text{Mn}_0.25\text{O}(\text{PO}_4)$ ) 782495-64-1, Lithium niobium oxide  
 phosphate ( $\text{Li}_3.75\text{Nb}_0.25\text{O}(\text{PO}_4)$ ) 782495-65-2, Lithium molybdenum  
 oxide phosphate ( $\text{Li}_3.5\text{Mo}_0.25\text{O}(\text{PO}_4)$ ) 782495-66-3, Lithium tantalum  
 oxide phosphate ( $\text{Li}_3.75\text{Ta}_0.25\text{O}(\text{PO}_4)$ ) 782495-67-4, Lithium tungsten  
 oxide phosphate ( $\text{Li}_3.5\text{W}_0.25\text{O}(\text{PO}_4)$ ) 782495-69-6, Lithium tungsten  
 oxide phosphate ( $\text{Li}_3.02\text{W}_0.01\text{O}_0.04(\text{PO}_4)$ ) 782495-70-9, Lithium  
 tungsten oxide phosphate ( $\text{Li}_3.2\text{W}_0.1\text{O}_0.4(\text{PO}_4)$ ) 782495-72-1, Lithium  
 tungsten oxide phosphate ( $\text{Li}_3.66\text{W}_0.33\text{O}_1.32(\text{PO}_4)$ ) 782495-74-3,  
 Lithium tungsten oxide phosphate ( $\text{Li}_5\text{W}_0.4(\text{PO}_4)$ ) 816415-85-7  
 , Boron lithium nitride oxide ( $\text{BLi}_0.8\text{N}_0.3\text{O}_1.45$ ) 816416-34-9  
 , Germanium lithium nitride oxide ( $\text{GeLi}_1.8\text{N}_0.3\text{O}_2.45$ )  
 816416-38-3, Aluminum lithium nitride oxide  
 ( $\text{AlLi}_0.8\text{N}_0.3\text{O}_1.45$ ) 816416-40-7, Aluminum lithium nitride  
 oxide ( $\text{AlLi}_4.8\text{N}_0.3\text{O}_3.45$ ) 816416-42-9, Carbon lithium  
 nitride oxide ( $\text{CLi}_1.8\text{N}_0.3\text{O}_2.45$ ) 816416-44-1, Gallium  
 lithium nitride oxide ( $\text{GaLi}_0.8\text{N}_0.3\text{O}_1.45$ ) 816416-46-3,  
 Lithium sulfur nitride oxide ( $\text{Li}_1.8\text{S}\text{N}_0.3\text{O}_3.45$ ) 816416-50-9  
 , Boron lithium nitride oxide silicate ( $\text{B}_0.5\text{Li}_{2.3}\text{N}_0.3\text{O}_0.45(\text{SiO}_4)_0.5$ )  
 816416-52-1, Germanium lithium nitride oxide silicate  
 ( $\text{Ge}_0.5\text{Li}_{3.8}\text{N}_0.3\text{O}_1.45(\text{SiO}_4)_0.5$ ) 816416-54-3, Carbon lithium  
 nitride oxide silicate ( $\text{C}_0.5\text{Li}_{2.8}\text{N}_0.3\text{O}_2.95(\text{SiO}_4)_0.5$ )  
 816416-56-5, Lithium silicon nitride oxide sulfate  
 ( $\text{Li}_{2.8}\text{Si}_0.5\text{N}_0.3\text{O}_1.45(\text{SO}_4)_0.5$ ) 816416-58-7, Germanium  
 lithium borate nitride oxide ( $\text{Ge}_0.5\text{Li}_{2.3}(\text{BO}_3)_0.5\text{N}_0.3\text{O}_0.95$ )

816416-60-1, Aluminum lithium borate nitride oxide  
 $(Al_0.5Li_2.8(BO_3)_0.5NO_3O_0.95)$  816416-62-3, Boron lithium  
carbonate nitride oxide  $(B_0.5Li_1.3(CO_3)_0.5NO_3O_0.45)$   
816416-64-5, Gallium lithium borate nitride oxide  
 $(Ga_0.5Li_0.8(BO_2)_0.5NO_3O_0.45)$  816416-66-7, Boron lithium  
nitride oxide sulfate  $(B_0.5Li_1.3NO_3O_0.45(SO_4)_0.5)$   
816416-68-9 816416-70-3, Germanium lithium nitride  
oxide sulfate  $(Ge_0.5Li_2.8NO_3O_1.45(SO_4)_0.5)$  816416-74-7,  
Carbon lithium nitride oxide sulfate  $(C_0.5Li_1.8NO_3O_0.95(SO_4)_0.5)$   
882681-95-0, Lithium titanium oxide phosphate  $(Li_2.8Ti_0.2O_0.3(PO_4))$   
882682-19-1, Lithium zirconium oxide phosphate  $(Li_4Zr_0.25O_4(PO_4))$   
882682-60-2, Aluminum gallium lithium nitride oxide  
 $(Al_0.5Ga_0.5Li_2.8NO_3O_3.45)$  882682-64-6, Lithium silicon  
nitride oxide  $(Li_1.8SiNO_3O_2.15)$  884739-67-7, Lithium  
silicon nitride oxide  $(Li_1.8SiNO_3O_2.45)$   
RL: DEV (Device component use); PEP (Physical, engineering or  
chemical process); PYP (Physical process); PROC (Process)  
(protective coating; anode having lithium mixed oxide protective  
coating with high water resistance and ion conductivity on pretreatment  
coating for Li battery)

L16 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2005:16060 HCAPLUS  
DOCUMENT NUMBER: 142:97542  
TITLE: Solid electrolyte for all-solid battery  
INVENTOR(S): Ugaji, Masaya; Mino, Shinji; Shibano, Yasuyuki;  
Ito, Shuji  
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
SOURCE: PCT Int. Appl., 28 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005001982	A1	20050106	WO 2004-JP9299	20040624

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,  
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR,  
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,  
MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE,  
SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,  
VN, YU, ZA, ZM, ZW  
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,  
AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,  
DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL,  
PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG

JP 2005038844	A	20050210	JP 2004-186807	20040624
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JP 3677509	B2	20050803		
EP 1675206	A1	20060628	EP 2004-746768	



200406  
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK  
CN 1799161 A 20060705 CN 2004-80014895

200406  
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US 2007042272 A1 20070222 US 2005-553238

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PRIORITY APPLN. INFO.: JP 2003-184626 A

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WO 2004-JP9299 W

200406  
24

&lt;--

AB The title solid electrolyte can be represented by the following  
general formula:  $\text{Li}_x\text{M}_v\text{O}_z\text{N}_z$  (wherein M represents at least one element  
selected from the group consisting of Si, B, Ge, Al, C, Ga and S;  
and  $x = 0.6-5.0$ ,  $v = 1.050-3.985$ , and  $z = 0.01-0.50$ ). The material  
is used for preparation of all-solid battery and is characterized by  
having good resistance to humidity.

IT 816415-83-5, Lithium nitride oxide silicate  
( $\text{Li}_{3.8}\text{N}_{0.3}\text{O}_{0.45}(\text{SiO}_3)$ ) 816415-85-7, Boron lithium nitride  
oxide ( $\text{BLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ ) 816416-34-9, Germanium lithium  
nitride oxide ( $\text{GeLi}_{1.8}\text{N}_{0.3}\text{O}_{2.45}$ ) 816416-36-1, Germanium  
lithium nitride oxide ( $\text{GeLi}_{3.8}\text{N}_{0.3}\text{O}_{3.45}$ ) 816416-38-3,  
Aluminum lithium nitride oxide ( $\text{ALi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ )  
816416-40-7, Aluminum lithium nitride oxide  
( $\text{ALi}_{4.8}\text{N}_{0.3}\text{O}_{3.45}$ ) 816416-42-9, Carbon lithium nitride  
oxide ( $\text{CLi}_{1.8}\text{N}_{0.3}\text{O}_{2.45}$ ) 816416-44-1, Gallium lithium  
nitride oxide ( $\text{GaLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ ) 816416-46-3, Lithium  
sulfur nitride oxide ( $\text{Li}_{1.8}\text{S}\text{N}_{0.3}\text{O}_{3.45}$ ) 816416-50-9, Boron  
lithium nitride oxide silicate ( $\text{B}_{0.5}\text{Li}_{2.3}\text{N}_{0.3}\text{O}_{0.45}(\text{SiO}_4)_{0.5}$ )  
816416-52-1, Germanium lithium nitride oxide silicate  
( $\text{Ge}_{0.5}\text{Li}_{3.8}\text{N}_{0.3}\text{O}_{1.45}(\text{SiO}_4)_{0.5}$ ) 816416-54-3, Carbon lithium  
nitride oxide silicate ( $\text{C}_{0.5}\text{Li}_{2.8}\text{N}_{0.3}\text{O}_{2.95}(\text{SiO}_4)_{0.5}$ )  
816416-56-5, Lithium silicon nitride oxide sulfate  
( $\text{Li}_{2.8}\text{Si}_{0.5}\text{N}_{0.3}\text{O}_{1.45}(\text{SO}_4)_{0.5}$ ) 816416-58-7, Germanium  
lithium borate nitride oxide ( $\text{Ge}_{0.5}\text{Li}_{2.3}(\text{BO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.95}$ )  
816416-60-1, Aluminum lithium borate nitride oxide  
( $\text{Al}_{0.5}\text{Li}_{2.8}(\text{BO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.95}$ ) 816416-62-3, Boron lithium  
carbonate nitride oxide ( $\text{B}_{0.5}\text{Li}_{1.3}(\text{CO}_3)_{0.5}\text{N}_{0.3}\text{O}_{0.45}$ )  
816416-64-5, Gallium lithium borate nitride oxide  
( $\text{Ga}_{0.5}\text{Li}_{0.8}(\text{BO}_2)_{0.5}\text{N}_{0.3}\text{O}_{0.45}$ ) 816416-66-7, Boron lithium  
nitride oxide sulfate ( $\text{B}_{0.5}\text{Li}_{1.3}\text{N}_{0.3}\text{O}_{0.45}(\text{SO}_4)_{0.5}$ )  
816416-68-9 816416-70-3, Germanium lithium nitride  
oxide sulfate ( $\text{Ge}_{0.5}\text{Li}_{2.8}\text{N}_{0.3}\text{O}_{1.45}(\text{SO}_4)_{0.5}$ ) 816416-72-5,  
Aluminum gallium lithium nitride oxide ( $\text{Al}_{0.5}\text{Ga}_{0.5}\text{Li}_{2.8}\text{N}_{0.3}\text{O}_{2.45}$ )  
816416-74-7, Carbon lithium nitride oxide sulfate  
( $\text{C}_{0.5}\text{Li}_{1.8}\text{N}_{0.3}\text{O}_{0.95}(\text{SO}_4)_{0.5}$ ) 816416-78-1, Lithium nitride  
oxide silicate ( $\text{Li}_{3.8}\text{N}_{0.01}\text{O}_{0.89}(\text{SiO}_3)$ ) 816416-80-5,  
Lithium nitride oxide silicate ( $\text{Li}_{3.8}\text{N}_{0.1}\text{O}_{0.75}(\text{SiO}_3)$ )  
816416-83-8, Lithium nitride oxide silicate  
( $\text{Li}_{3.8}\text{N}_{0.5}\text{O}_{0.15}(\text{SiO}_3)$ )

RL: TEM (Technical or engineered material use); USES (Uses)  
(solid electrolyte; solid electrolyte for preparation of all-solid  
battery)

RN 816415-83-5 HCAPLUS

CN Lithium nitride oxide silicate ( $\text{Li}_{3.8}\text{N}_{0.3}\text{O}_{0.45}(\text{SiO}_3)$ ) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
O3Si	1	15593-90-5
Li	3.8	7439-93-2

RN 816415-85-7 HCAPLUS

CN Boron lithium nitride oxide ( $\text{BLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ ) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
B	1	7440-42-8
Li	0.8	7439-93-2

RN 816416-34-9 HCAPLUS

CN Germanium lithium nitride oxide ( $\text{GeLi}_{1.8}\text{N}_{0.3}\text{O}_{2.45}$ ) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	2.45	17778-80-2
Ge	1	7440-56-4
Li	1.8	7439-93-2

RN 816416-36-1 HCAPLUS

CN Germanium lithium nitride oxide ( $\text{GeLi}_{3.8}\text{N}_{0.3}\text{O}_{3.45}$ ) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	3.45	17778-80-2
Ge	1	7440-56-4
Li	3.8	7439-93-2

RN 816416-38-3 HCAPLUS

CN Aluminum lithium nitride oxide ( $\text{AlLi}_{0.8}\text{N}_{0.3}\text{O}_{1.45}$ ) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
Li	0.8	7439-93-2
Al	1	7429-90-5

RN 816416-40-7 HCAPLUS

CN Aluminum lithium nitride oxide (AlLi<sub>4.8</sub>N<sub>0.3</sub>O<sub>3.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	3.45	17778-80-2
Li	4.8	7439-93-2
Al	1	7429-90-5

RN 816416-42-9 HCAPLUS

CN Carbon lithium nitride oxide (CLi<sub>1.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
C	1	7440-44-0
Li	1.8	7439-93-2

RN 816416-44-1 HCAPLUS

CN Gallium lithium nitride oxide (GaLi<sub>0.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
Ga	1	7440-55-3
Li	0.8	7439-93-2

RN 816416-46-3 HCAPLUS

CN Lithium sulfur nitride oxide (Li<sub>1.8</sub>SN<sub>0.3</sub>O<sub>3.45</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	3.45	17778-80-2
S	1	7704-34-9
Li	1.8	7439-93-2

RN 816416-50-9 HCAPLUS

CN Boron lithium nitride oxide silicate (B<sub>0.5</sub>Li<sub>2.3</sub>N<sub>0.3</sub>O<sub>0.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.45	17778-80-2
O <sub>4</sub> Si	0.5	17181-37-2
B	0.5	7440-42-8
Li	2.3	7439-93-2

RN 816416-52-1 HCAPLUS

CN Germanium lithium nitride oxide silicate  
(Ge<sub>0.5</sub>Li<sub>3.8</sub>N<sub>0.3</sub>O<sub>1.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
O4Si	0.5	17181-37-2
Ge	0.5	7440-56-4
Li	3.8	7439-93-2

RN 816416-54-3 HCAPLUS

CN Carbon lithium nitride oxide silicate (C0.5Li2.8N0.3O2.95(SiO4)0.5)  
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
O4Si	0.5	17181-37-2
C	0.5	7440-44-0
Li	2.8	7439-93-2

RN 816416-56-5 HCAPLUS

CN Lithium silicon nitride oxide sulfate (Li2.8Si0.5N0.3O1.45(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
O4S	0.5	14808-79-8
Si	0.5	7440-21-3
Li	2.8	7439-93-2

RN 816416-58-7 HCAPLUS

CN Germanium lithium borate nitride oxide (Ge0.5Li2.3(BO3)0.5N0.3O0.95)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Ge	0.5	7440-56-4
Li	2.3	7439-93-2

RN 816416-60-1 HCAPLUS

CN Aluminum lithium borate nitride oxide (Al0.5Li2.8(BO3)0.5N0.3O0.95)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
BO3	0.5	14213-97-9
Li	2.8	7439-93-2
Al	0.5	7429-90-5

RN 816416-62-3 HCAPLUS

CN Boron lithium carbonate nitride oxide (B0.5Li1.3(CO3)0.5N0.3O0.45)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.45	17778-80-2
B	0.5	7440-42-8
Li	1.3	7439-93-2
CO3	0.5	3812-32-6

RN 816416-64-5 HCAPLUS

CN Gallium lithium borate nitride oxide (Ga0.5Li0.8(BO2)0.5N0.3O0.45)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.45	17778-80-2
BO2	0.5	14100-65-3
Ga	0.5	7440-55-3
Li	0.8	7439-93-2

RN 816416-66-7 HCAPLUS

CN Boron lithium nitride oxide sulfate (B0.5Li1.3N0.3O0.45(SO4)0.5)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.45	17778-80-2
O4S	0.5	14808-79-8
B	0.5	7440-42-8
Li	1.3	7439-93-2

RN 816416-68-9 HCAPLUS

CN Germanium lithium carbonate nitride oxide  
(Ge0.5Li2.8(CO3)0.5N0.3O1.45) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	1.45	17778-80-2
Ge	0.5	7440-56-4
Li	2.8	7439-93-2
CO3	0.5	3812-32-6

RN 816416-70-3 HCAPLUS

CN Germanium lithium nitride oxide sulfate  
(Ge0.5Li2.8N0.3O1.45(SO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====

N	0.3	17778-88-0
O	1.45	17778-80-2
O4S	0.5	14808-79-8
Ge	0.5	7440-56-4
Li	2.8	7439-93-2

RN 816416-72-5 HCAPLUS

CN Aluminum gallium lithium nitride oxide (Al<sub>0.5</sub>Ga<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.3</sub>O<sub>2.45</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	2.45	17778-80-2
Ga	0.5	7440-55-3
Li	2.8	7439-93-2
Al	0.5	7429-90-5

RN 816416-74-7 HCAPLUS

CN Carbon lithium nitride oxide sulfate (C<sub>0.5</sub>Li<sub>1.8</sub>N<sub>0.3</sub>O<sub>0.95</sub>(SO<sub>4</sub>)<sub>0.5</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.95	17778-80-2
O4S	0.5	14808-79-8
C	0.5	7440-44-0
Li	1.8	7439-93-2

RN 816416-78-1 HCAPLUS

CN Lithium nitride oxide silicate (Li<sub>3.8</sub>N<sub>0.01</sub>O<sub>0.89</sub>(SiO<sub>3</sub>)) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.01	17778-88-0
O	0.89	17778-80-2
O3Si	1	15593-90-5
Li	3.8	7439-93-2

RN 816416-80-5 HCAPLUS

CN Lithium nitride oxide silicate (Li<sub>3.8</sub>N<sub>0.1</sub>O<sub>0.75</sub>(SiO<sub>3</sub>)) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.1	17778-88-0
O	0.75	17778-80-2
O3Si	1	15593-90-5
Li	3.8	7439-93-2

RN 816416-83-8 HCAPLUS

CN Lithium nitride oxide silicate (Li<sub>3.8</sub>N<sub>0.5</sub>O<sub>0.15</sub>(SiO<sub>3</sub>)) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.5	17778-88-0
O	0.15	17778-80-2
O3Si	1	15593-90-5
Li	3.8	7439-93-2

IC ICM H01M010-36

ICS H01B001-06; H01M006-18

CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 72

IT 693781-19-0, Lithium metaphosphate nitride oxide  
(Li<sub>2.8</sub>(PO<sub>3</sub>)N<sub>0.300.45</sub>) **816415-83-5**, Lithium nitride oxide  
silicate (Li<sub>3.8</sub>N<sub>0.300.45</sub>(SiO<sub>3</sub>)) **816415-84-6**, Lithium nitride oxide  
silicide (Li<sub>1.8</sub>N<sub>3O2.45</sub>Si) **816415-85-7**, Boron lithium  
nitride oxide (BLi<sub>0.8</sub>N<sub>0.301.45</sub>) **816416-34-9**, Germanium  
lithium nitride oxide (GeLi<sub>1.8</sub>N<sub>0.302.45</sub>) **816416-36-1**,  
Germanium lithium nitride oxide (GeLi<sub>3.8</sub>N<sub>0.303.45</sub>)  
**816416-38-3**, Aluminum lithium nitride oxide  
(ALi<sub>0.8</sub>N<sub>0.301.45</sub>) **816416-40-7**, Aluminum lithium nitride  
oxide (ALi<sub>4.8</sub>N<sub>0.303.45</sub>) **816416-42-9**, Carbon lithium  
nitride oxide (CLi<sub>1.8</sub>N<sub>0.302.45</sub>) **816416-44-1**, Gallium  
lithium nitride oxide (GaLi<sub>0.8</sub>N<sub>0.301.45</sub>) **816416-46-3**,  
Lithium sulfur nitride oxide (Li<sub>1.8</sub>S<sub>0.303.45</sub>) **816416-50-9**  
, Boron lithium nitride oxide silicate (B<sub>0.5</sub>Li<sub>2.3</sub>N<sub>0.300.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
**816416-52-1**, Germanium lithium nitride oxide silicate  
(Ge<sub>0.5</sub>Li<sub>3.8</sub>N<sub>0.301.45</sub>(SiO<sub>4</sub>)<sub>0.5</sub>) **816416-54-3**, Carbon lithium  
nitride oxide silicate (C<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.302.95</sub>(SiO<sub>4</sub>)<sub>0.5</sub>)  
**816416-56-5**, Lithium silicon nitride oxide sulfate  
(Li<sub>2.8</sub>Si<sub>0.5</sub>N<sub>0.301.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>) **816416-58-7**, Germanium  
lithium borate nitride oxide (Ge<sub>0.5</sub>Li<sub>2.3</sub>(BO<sub>3</sub>)<sub>0.5</sub>N<sub>0.300.95</sub>)  
**816416-60-1**, Aluminum lithium borate nitride oxide  
(Al<sub>0.5</sub>Li<sub>2.8</sub>(BO<sub>3</sub>)<sub>0.5</sub>N<sub>0.300.95</sub>) **816416-62-3**, Boron lithium  
carbonate nitride oxide (B<sub>0.5</sub>Li<sub>1.3</sub>(CO<sub>3</sub>)<sub>0.5</sub>N<sub>0.300.45</sub>)  
**816416-64-5**, Gallium lithium borate nitride oxide  
(Ga<sub>0.5</sub>Li<sub>0.8</sub>(BO<sub>2</sub>)<sub>0.5</sub>N<sub>0.300.45</sub>) **816416-66-7**, Boron lithium  
nitride oxide sulfate (B<sub>0.5</sub>Li<sub>1.3</sub>N<sub>0.300.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>)  
**816416-68-9** **816416-70-3**, Germanium lithium nitride  
oxide sulfate (Ge<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.301.45</sub>(SO<sub>4</sub>)<sub>0.5</sub>) **816416-72-5**,  
Aluminum gallium lithium nitride oxide (Al<sub>0.5</sub>Ga<sub>0.5</sub>Li<sub>2.8</sub>N<sub>0.302.45</sub>)  
**816416-74-7**, Carbon lithium nitride oxide sulfate  
(C<sub>0.5</sub>Li<sub>1.8</sub>N<sub>0.300.95</sub>(SO<sub>4</sub>)<sub>0.5</sub>) **816416-76-9**, Lithium oxide silicate  
(Li<sub>3.8</sub>O<sub>0.89</sub>(SiO<sub>3</sub>)) **816416-78-1**, Lithium nitride oxide  
silicate (Li<sub>3.8</sub>N<sub>0.0100.89</sub>(SiO<sub>3</sub>)) **816416-80-5**, Lithium  
nitride oxide silicate (Li<sub>3.8</sub>N<sub>0.100.75</sub>(SiO<sub>3</sub>)) **816416-83-8**,  
Lithium nitride oxide silicate (Li<sub>3.8</sub>N<sub>0.500.15</sub>(SiO<sub>3</sub>)) **816416-84-9**,  
Lithium nitride silicate (Li<sub>3.8</sub>N<sub>0.6</sub>(SiO<sub>3</sub>)) **816416-86-1**, Lithium  
silicon nitride oxide (Li<sub>3.8</sub>SiN<sub>0.2.4</sub>)

RL: TEM (Technical or engineered material use); USES (Uses)

(solid electrolyte; solid electrolyte for preparation of all-solid  
battery)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

=&gt; d l17 ibib abs hitstr hitind 1-21

L17 ANSWER 1 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2006:707619 HCAPLUS  
 DOCUMENT NUMBER: 145:170694  
 TITLE: LixAaMmBbPOzNn cathodic material for secondary lithium battery, and uses thereof  
 INVENTOR(S): Li, Hong; Huang, Xuejie; Wang, Deyu; Chen, Liqun  
 PATENT ASSIGNEE(S): Institute of Physics, Chinese Academy of Sciences, Peop. Rep. China  
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 7 pp.  
 CODEN: CNXXEV  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1691380	A	20051102	CN 2004-10037502	20040423

PRIORITY APPLN. INFO.: CN 2004-10037502  
 20040423

AB The title material has chemical formula of LixAaMmBbPOzNn (A = Na, Mg, Ti, V, Cr, Cu, Mn, Co, Ni, Zn, Ga, In, Ge, Ag, Hg, Au, Zr, Nb, W; M = Fe, Co, Mn, Ni, V; B = Li, Na, K, Ca, Mg, Ti, V, Cr, Cu, Mn, Co, Ni, Zn, Ga, In, Ge, Ag, Hg, Au, Zr, Nb, W; M and B are different element;  $0.9 \leq x \leq 4$ ;  $0 \leq a \leq 0.1$ ;  $0.5 \leq m \leq 1$ ;  $0 \leq b \leq 0.5$ ;  $3 \leq z \leq 4$ ; and  $0.01 \leq n \leq 1$ ). It has the advantages of good electronic conductivity and ionic conductivity, improved rate discharge ability and large lithium storage capacity.

IT 900170-70-9P 900170-89-0P 900170-93-6P  
 900171-10-0P  
 RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (lithium battery cathode active substance)

RN 900170-70-9 HCAPLUS  
 CN Germanium iron lithium sodium metaphosphate nitride oxide  
 (Ge0.06Fe0.9Li0.92Na0.2(PO3)N0.12O0.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.12	17778-88-0
O	0.9	17778-80-2
O3P	1	15389-19-2
Ge	0.06	7440-56-4
Na	0.2	7440-23-5
Li	0.92	7439-93-2
Fe	0.9	7439-89-6

RN 900170-89-0 HCAPLUS  
 CN Gallium iron lithium vanadium metaphosphate nitride oxide  
 (Ga0.02Fe0.7Li0.95V0.2(PO3)N0.100.9) (9CI) (CA INDEX NAME)



Component	Ratio	Component Registry Number
=====	=====	=====
N	0.1	17778-88-0
O	0.9	17778-80-2
O3P	1	15389-19-2
V	0.2	7440-62-2
Ga	0.02	7440-55-3
Li	0.95	7439-93-2
Fe	0.7	7439-89-6

RN 900170-93-6 HCAPLUS

CN Gallium indium iron lithium metaphosphate nitride oxide  
 (Ga0.2In0.02Fe0.7Li0.95(PO3)N0.1O0.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.1	17778-88-0
O	0.9	17778-80-2
O3P	1	15389-19-2
In	0.02	7440-74-6
Ga	0.2	7440-55-3
Li	0.95	7439-93-2
Fe	0.7	7439-89-6

RN 900171-10-0 HCAPLUS

CN Germanium iron lithium metaphosphate nitride oxide  
 (Ge0.1Fe0.8Li1.1(PO3)N0.1O0.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.1	17778-88-0
O	0.9	17778-80-2
O3P	1	15389-19-2
Ge	0.1	7440-56-4
Li	1.1	7439-93-2
Fe	0.8	7439-89-6

IC ICM H01M004-58

ICS H01M004-48

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 900170-34-5P, Iron lithium metaphosphate nitride oxide  
 (FeLi1.2(PO3)N0.2O0.8) 900170-37-8P, Iron lithium nitride  
 phosphate (FeLi4N(PO4)) 900170-40-3P 900170-43-6P 900170-46-9P  
 900170-49-2P 900170-52-7P 900170-55-0P 900170-58-3P  
 900170-61-8P 900170-64-1P 900170-67-4P **900170-70-9P**  
 900170-73-2P 900170-76-5P 900170-79-8P 900170-82-3P  
 900170-85-6P **900170-89-0P 900170-93-6P**  
 900170-98-1P 900171-02-0P 900171-06-4P **900171-10-0P**  
 900171-14-4P 900171-18-8P

RL: PNU (Preparation, unclassified); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)  
 (lithium battery cathode active substance)

L17 ANSWER 2 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2006:113385 HCAPLUS

DOCUMENT NUMBER: 144:195248

TITLE: Method of fabrication of long life thin film

INVENTOR(S): battery  
 Bates, John B.  
 PATENT ASSIGNEE(S): Oak Ridge Micro-Energy, Inc., USA  
 SOURCE: U.S., 10 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6994933	B1	20060207	US 2002-244260	20020916

PRIORITY APPLN. INFO.: US 2002-244260  
 20020916

AB A thin film battery includes an anode layer, a cathode layer and a solid electrolyte layer. The battery also includes, a planarization layer applied to the thin film battery. The planarization layer has a surface roughness of no more than about 1.0 nm root mean square and a flatness no larger than about 0.005 cm/in. A barrier layer is applied to the planarization layer. The barrier layer is provided by one or more layers of material selected from the group consisting of polymeric materials, metals and ceramic materials. The planarization layer and barrier layer are sufficient to reduce oxygen flux through the barrier layer to the anode layer to no more than about 1.6  $\mu\text{mol}/\text{m}^2\text{-day}$ , and H<sub>2</sub>O flux through the barrier layer to the anode layer to less than about 3.3  $\mu\text{mol}/\text{m}^2\text{-day}$  thereby improving the life of the thin film battery.

IT 875314-60-6 875314-61-7 875314-62-8  
 875314-63-9 875314-64-0 875314-65-1  
 875314-66-2 875314-67-3

RL: DEV (Device component use); USES (Uses)  
 (method of fabrication of long life thin film battery)

RN 875314-60-6 HCAPLUS

CN Lithium metaphosphate nitride oxide sulfide  
 (Li<sub>0.39</sub>(PO<sub>3</sub>)<sub>0.12</sub>N<sub>0.02</sub>O<sub>0.09</sub>S<sub>0.01</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.02	17778-88-0
O	0.09	17778-80-2
O3P	0.12	15389-19-2
S	0.01	7704-34-9
Li	0.39	7439-93-2

RN 875314-61-7 HCAPLUS

CN Lithium metaphosphate nitride oxide sulfide  
 (Li<sub>0.4</sub>(PO<sub>3</sub>)<sub>0.12</sub>N<sub>0.03</sub>O<sub>0.08</sub>S<sub>0.01</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.03	17778-88-0

O	0.08	17778-80-2
O3P	0.12	15389-19-2
S	0.01	7704-34-9
Li	0.4	7439-93-2

RN 875314-62-8 HCAPLUS

CN Lithium metaphosphate nitride oxide sulfide  
(Li0.38(PO3)0.13N0.05O0.04S0.01) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.05	17778-88-0
O	0.04	17778-80-2
O3P	0.13	15389-19-2
S	0.01	7704-34-9
Li	0.38	7439-93-2

RN 875314-63-9 HCAPLUS

CN Lithium metaphosphate nitride oxide sulfide  
(Li0.38(PO3)0.13N0.06O0.03S0.01) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.06	17778-88-0
O	0.03	17778-80-2
O3P	0.13	15389-19-2
S	0.01	7704-34-9
Li	0.38	7439-93-2

RN 875314-64-0 HCAPLUS

CN Lithium metaphosphate nitride oxide sulfide  
(Li0.39(PO3)0.12N0.02O0.09S0.02) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.02	17778-88-0
O	0.09	17778-80-2
O3P	0.12	15389-19-2
S	0.02	7704-34-9
Li	0.39	7439-93-2

RN 875314-65-1 HCAPLUS

CN Lithium metaphosphate nitride oxide sulfide  
(Li0.38(PO3)0.13N0.04O0.04S0.02) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.04	17778-88-0
O	0.04	17778-80-2
O3P	0.13	15389-19-2
S	0.02	7704-34-9
Li	0.38	7439-93-2

RN 875314-66-2 HCAPLUS

CN Lithium metaphosphate nitride oxide sulfide  
(Li0.39(PO3)0.12N0.03O0.09S0.02) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.03	17778-88-0
O	0.09	17778-80-2
O3P	0.12	15389-19-2
S	0.02	7704-34-9
Li	0.39	7439-93-2

RN 875314-67-3 HCAPLUS

CN Lithium metaphosphate nitride oxide sulfide  
 (Li0.37(PO3)0.13NO.06O0.03S0.02) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.06	17778-88-0
O	0.03	17778-80-2
O3P	0.13	15389-19-2
S	0.02	7704-34-9
Li	0.37	7439-93-2

INCL 429162000; 429163000; 429127000; 429124000; 429231950

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 7439-93-2, Lithium, uses 184905-46-2, Lithium nitrogen phosphorus  
 oxide 875314-60-6 875314-61-7

875314-62-8 875314-63-9 875314-64-0

875314-65-1 875314-66-2 875314-67-3

RL: DEV (Device component use); USES (Uses)

(method of fabrication of long life thin film battery)

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L17 ANSWER 3 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2005:1332492 HCAPLUS

DOCUMENT NUMBER: 144:54471

TITLE: Synthesis of active material for nonaqueous  
 electrolyte secondary battery

INVENTOR(S): Yoshizawa, Hiroshi; Nakanishi, Shinji; Koshina,  
 Hizuru

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: U.S. Pat. Appl. Publ., 12 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2005281727	A1	20051222	US 2005-152087	200506 15
JP 2006032321	A	20060202	JP 2005-168131	200506 08

CN 1694286

A

20051109

CN 2005-10078953

200506  
14

KR 2006049222

A

20060518

KR 2005-51475

200506  
15

PRIORITY APPLN. INFO.:

JP 2004-178518

A

200406  
16

AB A resistivity of an active material is reduced to drastically decrease an amount of a conductive auxiliary agent to be added, in order to provide a nonaq. electrolyte secondary battery with high capacity. A material represented by a composition formula:  $\text{Li}_x\text{MeO}_y\text{N}_z$ , wherein  $0 \leq x \leq 2$ ,  $0.1 < y < 2.2$ ,  $0 < z < 1.4$ , and Me is at least one selected from the group consisting of Ti, Co, Ni, Mn, Si, Ge, and Sn is used as an active material.

IT 871475-57-9P, Lithium silicon nitride oxide ( $\text{LiO}-2\text{SiNO}-1.400.1-2.2$ ) 871475-59-1P, Germanium lithium nitride oxide ( $\text{GeLiO}-2\text{NO}-1.400.1-2.2$ )  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (synthesis of active material for nonaq. electrolyte secondary battery)

RN 871475-57-9 HCAPLUS

CN Lithium silicon nitride oxide ( $\text{LiO}-2\text{SiNO}-1.400.1-2.2$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0 - 1.4	17778-88-0
O	0.1 - 2.2	17778-80-2
Si	1	7440-21-3
Li	0 - 2	7439-93-2

RN 871475-59-1 HCAPLUS

CN Germanium lithium nitride oxide ( $\text{GeLiO}-2\text{NO}-1.400.1-2.2$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0 - 1.4	17778-88-0
O	0.1 - 2.2	17778-80-2
Ge	1	7440-56-4
Li	0 - 2	7439-93-2

IC ICM H01M004-58

INCL 423385000; 429231950; 429231600; 429224000; 429223000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 11105-01-4P, Silicon nitride oxide 71330-02-4P, Titanium nitride oxide ( $\text{TiNO}$ ) 130988-77-1P, Tin nitride oxide 500215-65-6P, Titanium nitride oxide ( $\text{TiNO}_3\text{O}_1.7$ ) 871475-49-9P, Lithium titanium nitride oxide ( $\text{LiO}-2\text{TiNO}-1.400.1-2.2$ ) 871475-51-3P, Cobalt lithium nitride oxide ( $\text{CoLiO}-2\text{NO}-1.400.1-2.2$ ) 871475-53-5P, Lithium nickel nitride oxide ( $\text{LiO}-2\text{NiNO}-1.400.1-2.2$ ) 871475-55-7P, Lithium

manganese nitride oxide (LiO-2MnNO-1.400.1-2.2) 871475-57-9P  
 , Lithium silicon nitride oxide (LiO-2SiNO-1.400.1-2.2)  
 871475-59-1P, Germanium lithium nitride oxide  
 (GeLiO-2NO-1.400.1-2.2) 871475-61-5P, Lithium tin nitride oxide  
 (LiO-2SnNO-1.400.1-2.2) 871475-63-7P, Titanium nitride oxide  
 (TiNO.1101.89) 871475-65-9P 871475-67-1P 871475-69-3P, Cobalt  
 lithium nitrogen oxide 871475-71-7P, Cobalt lithium nickel  
 nitrogen oxide 871475-73-9P, Lithium manganese nitrogen oxide  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (synthesis of active material for nonaq. electrolyte secondary  
 battery)

L17 ANSWER 4 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2005:431262 HCAPLUS

DOCUMENT NUMBER: 142:484778

TITLE: Boron-lithium-phosphorus nitrogen oxide as  
 glassy solid electrolytes for batteries and  
 electrochemical cells

INVENTOR(S): Martin, Michel; Blandenet, Olivier

PATENT ASSIGNEE(S): Centre Stephanois De Recherches Mecaniques  
 Hydromecanique Etfrottement, Fr.

SOURCE: Fr. Demande, 16 pp.

CODEN: FRXXBL

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2862432	A1	20050520	FR 2003-13378	20031114
			<--	
FR 2862432	B1	20060210		
CA 2545269	A1	20050602	CA 2004-2545269	20041109
			<--	
WO 2005050764	A1	20050602	WO 2004-FR2878	20041109
			<--	
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
EP 1680829	A1	20060719	EP 2004-805421	20041109

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
 PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS  
 JP 2007514278 T 20070531 JP 2006-538895

200411  
09

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KR 2007003767 A 20070105 KR 2006-709153

200605  
11

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PRIORITY APPLN. INFO.: FR 2003-13378 A

200311  
14

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WO 2004-FR2878 W

200411  
09

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AB A glassy solid electrolyte for thin-layer-type electrochem. cells has the atomic composition  $\text{Li}_{0.20-0.50}\text{P}_{0.05-0.15}\text{B}_{0.001-0.20}\text{O}_{0.35-0.50}\text{N}_{0.02-0.18}$ . The solid electrolyte is conveniently prepared by plasma-enhanced chemical vapor deposition, under nitrogen, of precursors  $(\text{Li}_3\text{PO}_4)_a(\text{B}_2\text{O}_3)_b(\text{Li}_2\text{O})_c$ , where  $a \geq 0.5$ ,  $b \geq 0.025$ , and  $c \geq 0.025$  (in which  $a + b + c = 1$ ).

IT 851993-82-3P, Lithium boride nitride oxide phosphide ( $\text{Li}_{0.2-0.5}\text{B}_{0-0.2}\text{N}_{0.02-0.18}\text{O}_{0.35-0.5}\text{P}_{0.05-0.15}$ ) 851993-84-5P, Lithium boride nitride oxide phosphide ( $\text{Li}_{0.44}\text{B}_{0.01}\text{N}_{0.07}\text{O}_{0.39}\text{P}_{0.09}$ ) 851993-85-6P, Lithium boride nitride oxide phosphide ( $\text{Li}_{0.23}\text{B}_{0.14}\text{N}_{0.12}\text{O}_{0.44}\text{P}_{0.07}$ )  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (solid electrolyte; boron-lithium-phosphorus nitrogen oxide as glassy solid electrolytes for batteries and electrochem. cells)

RN 851993-82-3 HCAPLUS

CN Lithium boride nitride oxide phosphide ( $\text{Li}_{0.2-0.5}\text{B}_{0-0.2}\text{N}_{0.02-0.18}\text{O}_{0.35-0.5}\text{P}_{0.05-0.15}$ ) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====		
N	0.02 - 0.18	17778-88-0
O	0.35 - 0.5	17778-80-2
P	0.05 - 0.15	7723-14-0
B	0 - 0.2	7440-42-8
Li	0.2 - 0.5	7439-93-2

RN 851993-84-5 HCAPLUS

CN Lithium boride nitride oxide phosphide ( $\text{Li}_{0.44}\text{B}_{0.01}\text{N}_{0.07}\text{O}_{0.39}\text{P}_{0.09}$ ) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====		
N	0.07	17778-88-0
O	0.39	17778-80-2
P	0.09	7723-14-0
B	0.01	7440-42-8
Li	0.44	7439-93-2

RN 851993-85-6 HCAPLUS  
 CN Lithium boride nitride oxide phosphide (Li0.23B0.14N0.12O0.44P0.07)  
 (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.12	17778-88-0
O	0.44	17778-80-2
P	0.07	7723-14-0
B	0.14	7440-42-8
Li	0.23	7439-93-2

IC ICM H01M004-58

ICS C03C003-19; C23C014-08

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 57

IT 839073-70-0P, Boron lithium nitrogen phosphorus oxide  
 851993-82-3P, Lithium boride nitride oxide phosphide  
 (Li0.2-0.5B0-0.2N0.02-0.18O0.35-0.5P0.05-0.15) 851993-84-5P  
 , Lithium boride nitride oxide phosphide  
 (Li0.44B0.01N0.07O0.39P0.09) 851993-85-6P, Lithium boride  
 nitride oxide phosphide (Li0.23B0.14N0.12O0.44P0.07)

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)

(solid electrolyte; boron-lithium-phosphorus nitrogen oxide as  
 glassy solid electrolytes for batteries and electrochem. cells)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L17 ANSWER 5 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2005:16061 HCAPLUS

DOCUMENT NUMBER: 142:97543

TITLE: Solid electrolyte and all-solid battery

INVENTOR(S): Ugaji, Masaya; Mino, Shinji; Shibano, Yasuyuki;  
 Ito, Shuji

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: PCT Int. Appl., 33 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2005001983	A1	20050106	WO 2004-JP9302	200406 24

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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,  
 CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
 GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR,  
 KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,  
 MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE,  
 SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,  
 VN, YU, ZA, ZM, ZW  
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,



AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,  
DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL,  
PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG

JP 2005038843 A 20050210 JP 2004-186806

200406  
24

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JP 3677508 B2 20050803  
EP 1667272 A1 20060607 EP 2004-746771

200406  
24

<--

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK  
CN 1795577 A 20060628 CN 2004-80014739

200406  
24

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US 2006210882 A1 20060921 US 2005-553208

200510  
13

<--

PRIORITY APPLN. INFO.: JP 2003-184625 A

200306  
27

<--

WO 2004-JP9302 W

200406  
24

<--

AB The title solid electrolyte can be represented by the following  
general formula:  $\text{Li}_a\text{Pb}_b\text{M}_c\text{O}_d\text{N}_e$  (wherein M represents at least one  
element selected from the group consisting of Si, B, Ge, Al, C, Ga  
and S; and a, b, c, d and e resp. satisfy  $a = 0.62-4.98$ ,  $b =$   
 $0.01-0.99$ ,  $c = 0.01-0.99$ ,  $d = 1.070-3.985$ ,  $e = 0.01-0.50$ , and  $b + c$   
 $= 1.0$ ). This solid electrolyte is used for preparation of all solid  
battery and is characterized by having high resistance to humidity.

IT 816416-33-8 816416-35-0 816416-37-2  
816416-39-4 816416-41-8 816416-43-0  
816416-45-2, Aluminum lithium nitride oxide phosphate  
( $\text{Al}_{0.2}\text{Li}_{1.3}\text{N}_{0.3}\text{O}_{0.25}(\text{PO}_4)_{0.8}$ ) 816416-47-4  
816416-49-6 816416-51-0 816416-53-2  
816416-55-4 816416-57-6 816416-61-2  
816416-63-4, Lithium nitride oxide phosphate silicate  
( $\text{Li}_{3.4}\text{N}_{0.3}\text{O}_{0.05}(\text{PO}_4)_{0.4}(\text{SiO}_3)_{0.6}$ ) 816416-65-6, Lithium  
nitride oxide phosphate silicate ( $\text{Li}_{3.7}\text{N}_{0.3}\text{O}_{0.35}(\text{PO}_4)_{0.1}(\text{SiO}_3)_{0.9}$ )  
816416-67-8, Lithium nitride oxide phosphate silicate  
( $\text{Li}_{3.79}\text{N}_{0.3}\text{O}_{0.44}(\text{PO}_4)_{0.01}(\text{SiO}_3)_{0.99}$ ) 816416-69-0  
816416-71-4 816416-75-8 816416-77-0  
816416-79-2 816416-81-6, Lithium nitride oxide  
phosphate silicate ( $\text{Li}_3\text{N}_{0.01}\text{O}_{0.08}(\text{PO}_4)_{0.8}(\text{SiO}_3)_{0.2}$ )  
816416-82-7 816416-85-0 816416-87-2  
816416-88-3 816416-89-4

RL: TEM (Technical or engineered material use); USES (Uses)  
(solid electrolyte for preparation of all-solid battery)

RN 816416-33-8 HCAPLUS

CN Lithium metaphosphate nitride oxide silicate  
( $\text{Li}_3(\text{PO}_3)_{0.8}\text{N}_{0.3}\text{O}_{0.25}(\text{SiO}_4)_{0.2}$ ) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.25	17778-80-2
O4Si	0.2	17181-37-2
O3P	0.8	15389-19-2
Li	3	7439-93-2

RN 816416-35-0 HCAPLUS

CN Lithium metaphosphate nitride oxide silicate  
(Li<sub>2.6</sub>(PO<sub>3</sub>)<sub>0.8</sub>N<sub>0.3</sub>O<sub>0.05</sub>(SiO<sub>4</sub>)<sub>0.2</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.05	17778-80-2
O4Si	0.2	17181-37-2
O3P	0.8	15389-19-2
Li	2.6	7439-93-2

RN 816416-37-2 HCAPLUS

CN Lithium borate metaphosphate nitride oxide  
(Li<sub>2.4</sub>(BO<sub>3</sub>)<sub>0.2</sub>(PO<sub>3</sub>)<sub>0.8</sub>N<sub>0.3</sub>O<sub>0.05</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.05	17778-80-2
O3P	0.8	15389-19-2
BO3	0.2	14213-97-9
Li	2.4	7439-93-2

RN 816416-39-4 HCAPLUS

CN Germanium lithium nitride oxide phosphate  
(Ge<sub>0.2</sub>Li<sub>2.6</sub>N<sub>0.3</sub>O<sub>0.05</sub>(PO<sub>4</sub>)<sub>0.8</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.05	17778-80-2
O4P	0.8	14265-44-2
Ge	0.2	7440-56-4
Li	2.6	7439-93-2

RN 816416-41-8 HCAPLUS

CN Germanium lithium nitride oxide phosphate  
(Ge<sub>0.2</sub>Li<sub>3</sub>N<sub>0.3</sub>O<sub>0.25</sub>(PO<sub>4</sub>)<sub>0.8</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.25	17778-80-2
O4P	0.8	14265-44-2
Ge	0.2	7440-56-4
Li	3	7439-93-2

RN 816416-43-0 HCAPLUS  
 CN Aluminum lithium metaphosphate nitride oxide  
 (Al<sub>0.2</sub>Li<sub>2.4</sub>(PO<sub>3</sub>)<sub>0.8</sub>N<sub>0.3</sub>O<sub>0.65</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.65	17778-80-2
O3P	0.8	15389-19-2
Li	2.4	7439-93-2
Al	0.2	7429-90-5

RN 816416-45-2 HCAPLUS  
 CN Aluminum lithium nitride oxide phosphate  
 (Al<sub>0.2</sub>Li<sub>3.2</sub>N<sub>0.3</sub>O<sub>0.25</sub>(PO<sub>4</sub>)<sub>0.8</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.25	17778-80-2
O4P	0.8	14265-44-2
Li	3.2	7439-93-2
Al	0.2	7429-90-5

RN 816416-47-4 HCAPLUS  
 CN Lithium carbonate metaphosphate nitride oxide  
 (Li<sub>2.6</sub>(CO<sub>3</sub>)<sub>0.2</sub>(PO<sub>3</sub>)<sub>0.8</sub>N<sub>0.3</sub>O<sub>0.25</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.25	17778-80-2
O3P	0.8	15389-19-2
Li	2.6	7439-93-2
CO3	0.2	3812-32-6

RN 816416-49-6 HCAPLUS  
 CN Gallium lithium metaphosphate nitride oxide  
 (Ga<sub>0.2</sub>Li<sub>2.4</sub>(PO<sub>3</sub>)<sub>0.8</sub>N<sub>0.3</sub>O<sub>0.65</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.65	17778-80-2
O3P	0.8	15389-19-2
Ga	0.2	7440-55-3
Li	2.4	7439-93-2

RN 816416-51-0 HCAPLUS  
 CN Lithium metaphosphate nitride oxide sulfate  
 (Li<sub>2.6</sub>(PO<sub>3</sub>)<sub>0.8</sub>N<sub>0.3</sub>O<sub>0.25</sub>(SO<sub>4</sub>)<sub>0.2</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.65	17778-80-2
O3P	0.8	15389-19-2
Ga	0.2	7440-55-3
Li	2.4	7439-93-2

N	0.3	17778-88-0
O	0.25	17778-80-2
O3P	0.8	15389-19-2
O4S	0.2	14808-79-8
Li	2.6	7439-93-2

RN 816416-53-2 HCAPLUS

CN Lithium metaphosphate nitride oxide silicate  
(Li2.81(PO3)0.99N0.30O.44(SiO4)0.01) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.44	17778-80-2
O4Si	0.01	17181-37-2
O3P	0.99	15389-19-2
Li	2.81	7439-93-2

RN 816416-55-4 HCAPLUS

CN Lithium metaphosphate nitride oxide silicate  
(Li2.85(PO3)0.95N0.30O.4(SiO4)0.05) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.4	17778-80-2
O4Si	0.05	17181-37-2
O3P	0.95	15389-19-2
Li	2.85	7439-93-2

RN 816416-57-6 HCAPLUS

CN Lithium metaphosphate nitride oxide silicate  
(Li2.9(PO3)0.9N0.30O.35(SiO4)0.1) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.35	17778-80-2
O4Si	0.1	17181-37-2
O3P	0.9	15389-19-2
Li	2.9	7439-93-2

RN 816416-61-2 HCAPLUS

CN Lithium metaphosphate nitride oxide silicate  
(Li3.3(PO3)0.5N0.30O.45(SiO3)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
O3Si	0.5	15593-90-5
O3P	0.5	15389-19-2
Li	3.3	7439-93-2

RN 816416-63-4 HCAPLUS

CN Lithium nitride oxide phosphate silicate

(Li3.4N0.300.05(PO4)0.4(SiO3)0.6) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.05	17778-80-2
O3Si	0.6	15593-90-5
O4P	0.4	14265-44-2
Li	3.4	7439-93-2

RN 816416-65-6 HCAPLUS

CN Lithium nitride oxide phosphate silicate  
(Li3.7N0.300.35(PO4)0.1(SiO3)0.9) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.35	17778-80-2
O3Si	0.9	15593-90-5
O4P	0.1	14265-44-2
Li	3.7	7439-93-2

RN 816416-67-8 HCAPLUS

CN Lithium nitride oxide phosphate silicate  
(Li3.79N0.300.44(PO4)0.01(SiO3)0.99) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.44	17778-80-2
O3Si	0.99	15593-90-5
O4P	0.01	14265-44-2
Li	3.79	7439-93-2

RN 816416-69-0 HCAPLUS

CN Germanium lithium metaphosphate nitride oxide  
(Ge0.01Li2.81(PO3)0.99N0.300.48) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.48	17778-80-2
O3P	0.99	15389-19-2
Ge	0.01	7440-56-4
Li	2.81	7439-93-2

RN 816416-71-4 HCAPLUS

CN Germanium lithium metaphosphate nitride oxide  
(Ge0.1Li2.9(PO3)0.9N0.300.75) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.3	17778-88-0
O	0.75	17778-80-2
O3P	0.9	15389-19-2

Ge	0.1	7440-56-4
Li	2.9	7439-93-2

RN 816416-75-8 HCAPLUS  
 CN Germanium lithium nitride oxide phosphate  
 (Ge0.5Li3.3N0.3O1.45(PO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.45	17778-80-2
O4P	0.5	14265-44-2
Ge	0.5	7440-56-4
Li	3.3	7439-93-2

RN 816416-77-0 HCAPLUS  
 CN Germanium lithium nitride oxide phosphate  
 (Ge0.6Li3.4N0.3O1.85(PO4)0.4) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	1.85	17778-80-2
O4P	0.4	14265-44-2
Ge	0.6	7440-56-4
Li	3.4	7439-93-2

RN 816416-79-2 HCAPLUS  
 CN Germanium lithium nitride oxide phosphate  
 (Ge0.99Li3.79N0.3O3.41(PO4)0.01) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	3.41	17778-80-2
O4P	0.01	14265-44-2
Ge	0.99	7440-56-4
Li	3.79	7439-93-2

RN 816416-81-6 HCAPLUS  
 CN Lithium nitride oxide phosphate silicate  
 (Li3N0.01O0.08(PO4)0.8(SiO3)0.2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.01	17778-88-0
O	0.08	17778-80-2
O3Si	0.2	15593-90-5
O4P	0.8	14265-44-2
Li	3	7439-93-2

RN 816416-82-7 HCAPLUS  
 CN Lithium metaphosphate nitride oxide silicate  
 (Li3(PO3)0.8N0.1O0.55(SiO4)0.2) (CA INDEX NAME)

Component	Ratio	Component
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		Registry Number
N	0.1	17778-88-0
O	0.55	17778-80-2
O4Si	0.2	17181-37-2
O3P	0.8	15389-19-2
Li	3	7439-93-2

RN 816416-85-0 HCAPLUS

CN Lithium metaphosphate nitride oxide silicate  
(Li3(PO3)0.8N0.500.15(SiO3)0.2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.5	17778-88-0
O	0.15	17778-80-2
O3Si	0.2	15593-90-5
O3P	0.8	15389-19-2
Li	3	7439-93-2

RN 816416-87-2 HCAPLUS

CN Germanium lithium metaphosphate nitride oxide silicate  
(Ge0.1Li3(PO3)0.8N0.300.65(SiO4)0.1) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.65	17778-80-2
O4Si	0.1	17181-37-2
O3P	0.8	15389-19-2
Ge	0.1	7440-56-4
Li	3	7439-93-2

RN 816416-88-3 HCAPLUS

CN Germanium lithium borate metaphosphate nitride oxide  
(Ge0.1Li2.7(BO3)0.1(PO3)0.8N0.300.55) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.55	17778-80-2
O3P	0.8	15389-19-2
BO3	0.1	14213-97-9
Ge	0.1	7440-56-4
Li	2.7	7439-93-2

RN 816416-89-4 HCAPLUS

CN Aluminum lithium borate nitride oxide phosphate  
(Al0.1Li3(BO2)0.1N0.300.05(PO4)0.8) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.05	17778-80-2
O4P	0.8	14265-44-2
BO2	0.1	14100-65-3

Li		3		7439-93-2
Al		0.1		7429-90-5

IC ICM H01M010-36  
ICS H01B001-06; H01M006-18  
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 72  
IT 7440-06-4, Platinum, uses 816416-33-8 816416-33-8  
816416-35-0 816416-37-2 816416-39-4  
816416-41-8 816416-41-8 816416-43-0  
816416-43-0 816416-45-2, Aluminum lithium nitride  
oxide phosphate (Al<sub>0.2</sub>Li<sub>3.2</sub>N<sub>0.3</sub>O<sub>0.25</sub>(PO<sub>4</sub>)<sub>0.8</sub>) 816416-47-4  
816416-49-6 816416-51-0 816416-53-2  
816416-55-4 816416-57-6 816416-61-2  
816416-63-4, Lithium nitride oxide phosphate silicate  
(Li<sub>3.4</sub>N<sub>0.3</sub>O<sub>0.05</sub>(PO<sub>4</sub>)<sub>0.4</sub>(SiO<sub>3</sub>)<sub>0.6</sub>) 816416-65-6, Lithium  
nitride oxide phosphate silicate (Li<sub>3.7</sub>N<sub>0.3</sub>O<sub>0.35</sub>(PO<sub>4</sub>)<sub>0.1</sub>(SiO<sub>3</sub>)<sub>0.9</sub>)  
816416-67-8, Lithium nitride oxide phosphate silicate  
(Li<sub>3.7</sub>N<sub>0.3</sub>O<sub>0.44</sub>(PO<sub>4</sub>)<sub>0.01</sub>(SiO<sub>3</sub>)<sub>0.99</sub>) 816416-69-0  
816416-71-4 816416-75-8 816416-77-0  
816416-79-2 816416-81-6, Lithium nitride oxide  
phosphate silicate (Li<sub>3</sub>N<sub>0.01</sub>O<sub>0.08</sub>(PO<sub>4</sub>)<sub>0.8</sub>(SiO<sub>3</sub>)<sub>0.2</sub>)  
816416-82-7 816416-85-0 816416-87-2  
816416-88-3 816416-89-4  
RL: TEM (Technical or engineered material use); USES (Uses)  
(solid electrolyte for preparation of all-solid battery)  
REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L17 ANSWER 6 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 2004:852189 HCAPLUS  
DOCUMENT NUMBER: 142:65390  
TITLE: Optical recording medium containing cobalt  
complex in dye layer for increased oxidation  
resistance  
INVENTOR(S): Kim, Hwan Kun; Lee, Ki Taek; Park, Jong Jin;  
Kim, Jae Hwan  
PATENT ASSIGNEE(S): Hansol Paper Co., Ltd, S. Korea  
SOURCE: Repub. Korea, No pp. given  
CODEN: KRXXFC  
DOCUMENT TYPE: Patent  
LANGUAGE: Korean  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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KR 180890	B1	19990401	KR 1996-65463	199612 13

PRIORITY APPLN. INFO.: <-- .  
KR 1996-65463  
199612  
13

AB Antioxidant optical recording medium are provided, to improve the  
durability and humidity resistance of a recording layer, thereby to  
improve the reliability of data storage. The antioxidant optical



recording medium comprises a substrate; an organic dye recording layer; a reflection layer; and a protection layer, wherein the organic dye recording layer comprises 0.1-20 wt% of a cobalt compound based on the weight of the dye of the recording layer for improving oxidation resistance, and an organic dye. Preferably the cobalt compound is represented by the formula:  $\text{AmCo(CN)}_n \cdot (\text{DMF})_l$ , wherein A is  $\text{Li}^+$ ,  $\text{Na}^+$  or  $\text{Cs}^+$ ; m, n and l are independently an integer of 0-10; and DMF represents N,N-dimethylformamide.

IT 808132-02-7

RL: TEM (Technical or engineered material use); USES (Uses)  
(optical recording medium increasing antioxidization)

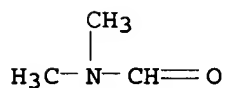
RN 808132-02-7 HCAPLUS

CN Formamide, N,N-dimethyl-, compd. with cobalt lithium cyanide  
( $\text{CoLi}_{0-10}(\text{CN})_{0-10}$ ) (9CI) (CA INDEX NAME)

CM 1

CRN 68-12-2

CMF C3 H7 N O



CM 2

CRN 808128-24-7

CMF C N . Co . Li

CCI TIS

CM 3

CRN 7440-48-4

CMF Co

Co

CM 4

CRN 7439-93-2

CMF Li

Li

CM 5

CRN 57-12-5

CMF C N

-C≡N

IC ICM B41M005-28  
 CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 IT 808132-02-7 808132-03-8 808132-04-9  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (optical recording medium increasing antioxidization)

L17 ANSWER 7 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2004:593859 HCAPLUS  
 DOCUMENT NUMBER: 142:345783  
 TITLE: Lithium Ion Conducting Lithium Sulfur Oxynitride Thin Film  
 AUTHOR(S): Joo, K.-H.; Sohn, H.-J.; Vinatier, P.; Pecquenard, B.; Levasseur, A.  
 CORPORATE SOURCE: Research Center for Energy Conversion and Storage, School of Materials Science and Engineering, Seoul National University, Seoul, 151-742, S. Korea  
 SOURCE: Electrochemical and Solid-State Letters (2004), 7(8), A256-A258  
 CODEN: ESLEF6; ISSN: 1099-0062  
 PUBLISHER: Electrochemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Thin-film solid electrolytes, Li S oxynitride (Lison), were fabricated by radiofrequency (rf) magnetron sputtering under various gas compns. Composition of the thin film was determined by atomic absorption spectroscopy, Rutherford backscattering spectroscopy, and energy-dispersive x-ray spectrometry. The ionic conductivity of the thin film at room temperature showed a maximum of  $2 + 10^{-5}$  S/cm for Li<sub>0.29</sub>S<sub>0.28</sub>O<sub>0.35</sub>N<sub>0.09</sub>. Microstructure of Lison thin films shows an amorphous nature when deposited under N atmospheric. The electrolyte was stable up to 5.5 V vs. Li/Li+.

IT 848476-04-0P, Lithium 29, nitrogen 9, oxygen 35, sulfur 28 (atomic) 848476-07-3P, Lithium 29, nitrogen 5, oxygen 38, sulfur 28 (atomic)  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)  
 (properties of lithium sulfide oxynitride ionic conductors prepared by sputtering)

RN 848476-04-0 HCAPLUS  
 CN Lithium nitride oxide sulfide (Li<sub>0.29</sub>N<sub>0.09</sub>O<sub>0.35</sub>S<sub>0.28</sub>) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.09	17778-88-0
O	0.35	17778-80-2
S	0.28	7704-34-9
Li	0.29	7439-93-2

RN 848476-07-3 HCAPLUS  
 CN Lithium nitride oxide sulfide (Li<sub>0.29</sub>N<sub>0.05</sub>O<sub>0.38</sub>S<sub>0.28</sub>) (9CI) (CA

## INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.05	17778-88-0
O	0.38	17778-80-2
S	0.28	7704-34-9
Li	0.29	7439-93-2

CC 76-2 (Electric Phenomena)

Section cross-reference(s): 52

IT 848476-04-0P, Lithium 29, nitrogen 9, oxygen 35, sulfur 28  
 (atomic) 848476-05-1P, Lithium 29, oxygen 53, sulfur 18 (atomic)  
 848476-06-2P, Lithium 29, oxygen 60, sulfur 11 (atomic)  
 848476-07-3P, Lithium 29, nitrogen 5, oxygen 38, sulfur 28  
 (atomic)

RL: PEP (Physical, engineering or chemical process); PRP  
 (Properties); PYP (Physical process); SPN (Synthetic preparation);  
 TEM (Technical or engineered material use); PREP (Preparation); PROC  
 (Process); USES (Uses)  
 (properties of lithium sulfide oxynitride ionic conductors prepared  
 by sputtering)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L17 ANSWER 8 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:207088 HCAPLUS

DOCUMENT NUMBER: 141:250440

TITLE: Optical Investigations of the Effect of Gradual  
 Substitution  $\text{NH}_4 \rightarrow \text{Cs}$  on the Ferroelastic  
 Phase Transition in a  $\text{CsLiSO}_4$  Crystal  
 AUTHOR(S): Mel'nikova, S. V.; Grankina, V. A.  
 CORPORATE SOURCE: Siberian Division, Kirensky Institute of  
 Physics, Russian Academy of Sciences,  
 Krasnoyarsk, 660036, Russia  
 SOURCE: Physics of the Solid State (Translation of  
 Fizika Tverdogo Tela (Sankt-Peterburg)) (2004), 46(3), 515-520  
 CODEN: PSOSD; ISSN: 1063-7834

PUBLISHER: MAIK Nauka/Interperiodica Publishing

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Crystals of  $\text{Cs}_x(\text{NH}_4)_{1-x}\text{LiSO}_4$  ( $0.39 \leq x \leq 1.0$ ) solid  
 solns. are grown and investigated using polarized light microscopy  
 and measurements of the birefringence in the temperature range 100-530 K.  
 The (x-T) phase diagram of the  $\text{Cs}_x(\text{NH}_4)_{1-x}\text{LiSO}_4$  solid solns. is  
 constructed. Upon substitution of ammonium for cesium in the  
 $\text{CsLiSO}_4$  crystal, the phase transition temperature gradually increases to  
 such a degree that the ferroelastic phase can exist at room temperature  
 The triple point of intersection of the Pmcn, P21cn, and P1121/n  
 phase boundaries is determined It is established that the introduction  
 of ammonium in small amts. has an unusually strong effect on the  
 refractive properties and character of the ferroelastic phase  
 transition in the  $\text{CsLiSO}_4$  crystal.

IT 753023-72-2, Ammonium cesium lithium sulfate  
 (( $\text{NH}_4$ ) $_{0.05}\text{Cs}_{0.95}\text{Li}(\text{SO}_4)$ ) 753023-74-4, Ammonium cesium  
 lithium sulfate (( $\text{NH}_4$ ) $_{0.29}\text{Cs}_{0.71}\text{Li}(\text{SO}_4)$ )

RL: PEP (Physical, engineering or chemical process); PRP

(Properties); PYP (Physical process); PROC (Process)  
(optical properties of  $\text{Cs}_x(\text{NH}_4)_{1-x}\text{LiSO}_4$  solid solns. in relation  
to ferroelastic phase transition)

RN 753023-72-2 HCAPLUS

CN Ammonium cesium lithium sulfate ( $(\text{NH}_4)_{0.05}\text{Cs}_{0.95}\text{Li}(\text{SO}_4)$ ) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O4S	1	14808-79-8
H4N	0.05	14798-03-9
Cs	0.95	7440-46-2
Li	1	7439-93-2

RN 753023-74-4 HCAPLUS

CN Ammonium cesium lithium sulfate ( $(\text{NH}_4)_{0.29}\text{Cs}_{0.71}\text{Li}(\text{SO}_4)$ ) (CA INDEX  
NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O4S	1	14808-79-8
H4N	0.29	14798-03-9
Cs	0.71	7440-46-2
Li	1	7439-93-2

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related  
Properties)

Section cross-reference(s): 68, 75

IT 13499-08-6, Cesium lithium sulfate ( $\text{CsLiSO}_4$ ) 753023-42-6

753023-72-2, Ammonium cesium lithium sulfate

( $(\text{NH}_4)_{0.05}\text{Cs}_{0.95}\text{Li}(\text{SO}_4)$ ) 753023-73-3 753023-74-4,

Ammonium cesium lithium sulfate ( $(\text{NH}_4)_{0.29}\text{Cs}_{0.71}\text{Li}(\text{SO}_4)$ )

753023-75-5 753023-77-7, Ammonium cesium lithium sulfate

( $(\text{NH}_4)_{0.61}\text{Cs}_{0.39}\text{Li}(\text{SO}_4)$ )

RL: PEP (Physical, engineering or chemical process); PRP

(Properties); PYP (Physical process); PROC (Process)

(optical properties of  $\text{Cs}_x(\text{NH}_4)_{1-x}\text{LiSO}_4$  solid solns. in relation  
to ferroelastic phase transition)

REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L17 ANSWER 9 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2003:427916 HCAPLUS

DOCUMENT NUMBER: 139:189923

TITLE: Structural and vibrational studies of  
 $\text{Li}[\text{K}_x(\text{NH}_4)_{1-x}]\text{SO}_4$  and  $\text{Li}_2\text{KNH}_4(\text{SO}_4)_2$  mixed  
crystals

AUTHOR(S): Mata, Jorge; Solans, Xavier; Molera, Judit

CORPORATE SOURCE: Departament de Cristallografia, Universitat de  
Barcelona, Barcelona, E-08028, Spain

SOURCE: Journal of Solid State Chemistry (2003  
, 173(1), 69-77

CODEN: JSSCBI; ISSN: 0022-4596

PUBLISHER: Elsevier Science

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Mixed crystals of  $\text{Li}[\text{K}_x(\text{NH}_4)_{1-x}]\text{SO}_4$  were obtained by evaporation from aqueous

solution at 313 K using different molar ratios of mixts. of  $\text{LiKSO}_4$  and  $\text{LiNH}_4\text{SO}_4$ . The crystals were characterized by Raman scattering and single-crystal and powder x-ray diffraction. Two types of compound were obtained:  $\text{Li}[\text{K}_x(\text{NH}_4)_{1-x}]\text{SO}_4$  with  $x \geq 0.94$  and  $\text{Li}_2\text{KNH}_4(\text{SO}_4)_2$ . Different phases of  $\text{Li}[\text{K}_x(\text{NH}_4)_{1-x}]\text{SO}_4$  were yielded according to the molar ratio used in the preparation. The 1st phase is isostructural to the room-temperature phase of  $\text{LiKSO}_4$ . The 2nd phase is the enantiomorph of the 1st, which is not observed in pure  $\text{LiKSO}_4$ , and the last is a disordered phase, which was also observed in  $\text{LiKSO}_4$ , and can be assumed as a mixture of domains of two preceding phases. In the 2nd type of compound  $\text{Li}_2\text{KNH}_4(\text{SO}_4)_2$ , the room-temperature phase is hexagonal, symmetry space group  $P6_3$  with cell-volume nine times that of  $\text{LiKSO}_4$ . In this phase, some cavities are occupied by  $\text{K}^+$  ions only, and others are occupied by either  $\text{K}^+$  or  $\text{NH}_4^+$  at random. Thermal analyses of both types of compds. were performed by DSC, ATD, TG and powder x-ray diffraction. The phase transition temps. for  $\text{Li}[\text{K}_x(\text{NH}_4)_{1-x}]\text{SO}_4$   $x \geq 0.94$  were affected by the random presence of the ammonium ion in this disordered system. The high-temperature phase of  $\text{Li}_2\text{KNH}_4(\text{SO}_4)_2$  is also hexagonal, space group  $P6_3/\text{mmc}$  with the cell a-parameter double that of  $\text{LiKSO}_4$ . The phase transition is at 471.9 K.

IT 280586-66-5P, Ammonium lithium potassium sulfate  
 $((\text{NH}_4)0.03\text{LiK}0.97(\text{SO}_4))$  578707-47-8P, Ammonium lithium  
 potassium sulfate  $((\text{NH}_4)0.07\text{LiK}0.93(\text{SO}_4))$   
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (preparation and crystal structure of)

RN 280586-66-5 HCAPLUS

CN Ammonium lithium potassium sulfate  $((\text{NH}_4)0.03\text{LiK}0.97(\text{SO}_4))$  (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0.03	14798-03-9
K	0.97	7440-09-7
Li	1	7439-93-2

RN 578707-47-8 HCAPLUS

CN Ammonium lithium potassium sulfate  $((\text{NH}_4)0.07\text{LiK}0.93(\text{SO}_4))$  (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0.07	14798-03-9
K	0.93	7440-09-7
Li	1	7439-93-2

IT 264615-51-2P, Ammonium lithium potassium sulfate  
 $((\text{NH}_4)0.06\text{LiK}0.94(\text{SO}_4))$  578707-51-4P, Ammonium lithium  
 potassium sulfate  $((\text{NH}_4)0-0.06\text{LiK}0.94-1(\text{SO}_4))$   
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)

(preparation and phase transition temps. vs. ammonium ion concentration in)

RN 264615-51-2 HCAPLUS

CN Ammonium lithium potassium sulfate  $((\text{NH}_4)0.06\text{LiK}0.94(\text{SO}_4))$  (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0.06	14798-03-9
K	0.94	7440-09-7
Li	1	7439-93-2

RN 578707-51-4 HCAPLUS

CN Ammonium lithium potassium sulfate ((NH4)0-0.06LiK0.94-1(SO4)) (CA  
INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0 - 0.06	14798-03-9
K	0.94 - 1	7440-09-7
Li	1	7439-93-2

CC 78-5 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 75

IT 280586-66-5P, Ammonium lithium potassium sulfate  
((NH4)0.03LiK0.97(SO4)) 578707-47-8P, Ammonium lithium  
potassium sulfate ((NH4)0.07LiK0.93(SO4))  
RL: PRP (Properties); SPN (Synthetic preparation); PREP  
(Preparation)

(preparation and crystal structure of)

IT 264615-51-2P, Ammonium lithium potassium sulfate  
((NH4)0.06LiK0.94(SO4)) 578707-51-4P, Ammonium lithium  
potassium sulfate ((NH4)0-0.06LiK0.94-1(SO4))  
RL: PRP (Properties); SPN (Synthetic preparation); PREP  
(Preparation)

(preparation and phase transition temps. vs. ammonium ion concentration in)

REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L17 ANSWER 10 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2000:337575 HCAPLUS

DOCUMENT NUMBER: 133:97619

TITLE: Study on the low-temperature dielectric behavior  
of LiKSO4 crystal and a Li(NH4)0.03K0.97SO4  
mixed crystal

AUTHOR(S): Shin, H. K.; Park, J. M.; Lee, Y. S.

CORPORATE SOURCE: Dept. of Physics, Daejin University, Pocheon,  
Kyunggi, 487-711, S. Korea

SOURCE: Sae Mulli (1999), 39(3), 203-207

CODEN: NWPYA4; ISSN: 0374-4914

PUBLISHER: Korean Physical Society

DOCUMENT TYPE: Journal

LANGUAGE: Korean

AB. LiKSO4 and Li(NH4)0.03K0.97SO4 crystals have been studied by using  
dielec. measurements at two different measuring frequencies in the  
range of temperature from 100 K to 270 K along the c axis. A specific  
thermal treatment was applied to the LiKSO4 sample. In contrast  
with the previous results, the dielec. anomaly expected from the  
phase transition around 250 K was not observed For  
Li(NH4)0.03K0.97SO4, no thermal treatment was used; in spite of

that, no nonreproducibility and no thermal hysteresis were observed in the exptl. results. The broadened dielec. anomaly observed in the dielec. constant  $\epsilon'$  of  $\text{Li}(\text{NH}_4)0.03\text{K}0.97\text{SO}_4$  was analyzed and was ascribed to a contribution from the motion of multiple domain walls.

IT 280586-66-5, Ammonium lithium potassium sulfate  
 $((\text{NH}_4)0.03\text{Li}0.97(\text{SO}_4))$   
 RL: PRP (Properties)  
 (low-temperature dielec. behavior of  $\text{LiKSO}_4$  crystal and a  
 $\text{Li}(\text{NH}_4)0.03\text{K}0.97\text{SO}_4$  mixed crystal)  
 RN 280586-66-5 HCAPLUS  
 CN Ammonium lithium potassium sulfate  $((\text{NH}_4)0.03\text{Li}0.97(\text{SO}_4))$  (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O4S	1	14808-79-8
H4N	0.03	14798-03-9
K	0.97	7440-09-7
Li	1	7439-93-2

CC 76-8 (Electric Phenomena)  
 IT 14520-76-4, Lithium potassium sulfate 280586-66-5,  
 Ammonium lithium potassium sulfate  $((\text{NH}_4)0.03\text{Li}0.97(\text{SO}_4))$   
 RL: PRP (Properties)  
 (low-temperature dielec. behavior of  $\text{LiKSO}_4$  crystal and a  
 $\text{Li}(\text{NH}_4)0.03\text{K}0.97\text{SO}_4$  mixed crystal)

L17 ANSWER 11 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2000:165726 HCAPLUS  
 DOCUMENT NUMBER: 132:302398  
 TITLE: X-ray diffraction, thermal analysis and Raman  
 spectroscopy characterization of  $\text{Li}(\text{NH}_4)1-x\text{K}x\text{SO}_4$   
 solid solution  
 AUTHOR(S): Mata, J.; Solans, X.; Calvet, T.  
 CORPORATE SOURCE: Departament de Cristal·lografia,  
 Universitat de Barcelona, Barcelona, 08028,  
 Spain  
 SOURCE: Boletín de la Sociedad Española de Cerámica y  
 Vidrio (1999), 38(5), 451-454  
 CODEN: BSCVB9; ISSN: 0366-3175  
 PUBLISHER: Sociedad Española de Cerámica y Vidrio  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Spanish

AB The preparation and characterization of mixed crystals  $\text{Li}(\text{NH}_4)1-x\text{K}x\text{SO}_4$  was carried out. The characterization was by thermal anal., x-ray diffraction on powder and single crystal samples at variable temperature and Raman spectroscopy at variable temperature. Two phases were obtained. One is a solid solution (data reported for  $x = 0.94$ ) with  $0.94 < x < 1$ , with the same phases as those observed in  $\text{LiKSO}_4$ , but also with new phases which can be obtained according to the crystallization process. The 2nd type of compound has the formula  $\text{Li}(\text{NH}_4)0.53\text{K}0.47\text{SO}_4$ , with an hexagonal structure ( $a \approx 3 a\text{LiKSO}_4$ ). This compound has a phase transition at 463K.

IT 264615-51-2P, Ammonium lithium potassium sulfate  
 $((\text{NH}_4)0.06\text{Li}0.94(\text{SO}_4))$   
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (preparation and crystal structure of polymorphs of)

RN 264615-51-2 HCAPLUS  
 CN Ammonium lithium potassium sulfate ((NH4)0.06LiK0.94(SO4)) (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0.06	14798-03-9
K	0.94	7440-09-7
Li	1.	7439-93-2

CC 78-6 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 73, 75

IT 264615-51-2P, Ammonium lithium potassium sulfate  
 ((NH4)0.06LiK0.94(SO4))

RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)

(preparation and crystal structure of polymorphs of)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L17 ANSWER 12 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1999:171216 HCAPLUS

DOCUMENT NUMBER: 130:274333

TITLE: Investigation of phase transitions in  
 Li1-x(NH4)xSO4 mixed crystal

AUTHOR(S): Freire, P. T. C.; Paraguassu, W.; Silva, A. P.;  
 Pilla, O.; Teixeira, A. M. R.; Sasaki, J. M.;  
 Mendes Filho, J.; Guedes, I.; Melo, F. E. A.

CORPORATE SOURCE: Departamento de Fisica. Universidade Federal do  
 Ceara, Fortaleza, CE 60455-760, Brazil

SOURCE: Solid State Communications (1999),  
 109(8), 507-511

CODEN: SSCO44; ISSN: 0038-1098

PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Raman scattering results on LiK1-x(NH4)xSO4 mixed crystal for temps.  
 between 100 and 300 K are presented. In this temperature range the  
 crystal undergoes two different phase transitions, which the authors  
 call Bansal and Tomaszewski phase transitions. The introduction of  
 ammonium ions in the K sites increases the C66 → C3v4  
 (Bansal) phase transition temperature and decreases the Tomaszewski phase  
 transition temperature. Finally, the most impressive effect of the  
 presence of ammonium impurity in the LiKSO4 structure is the  
 decrease in the temperature hysteresis of Bansal phase transition and the  
 almost complete destruction of hysteresis in the Tomaszewski phase  
 transition, leading to a high temperature range of stability of the  
 trigonal phase.

IT 222056-72-6, Ammonium lithium potassium sulfate  
 ((NH4)0.04LiK0.96(SO4))

RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (phase transitions in)

RN 222056-72-6 HCAPLUS

CN Ammonium lithium potassium sulfate ((NH4)0.04LiK0.96(SO4)) (CA  
 INDEX NAME)

Component	Ratio	Component
-----------	-------	-----------



		Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0.04	14798-03-9
K	0.96	7440-09-7
Li	1	7439-93-2

CC 75-7 (Crystallography and Liquid Crystals)

Section cross-reference(s): 73

IT 222056-72-6, Ammonium lithium potassium sulfate  
((NH<sub>4</sub>)<sub>0.04</sub>LiK<sub>0.96</sub>(SO<sub>4</sub>))

RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(phase transitions in)

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L17 ANSWER 13 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1997:591394 HCAPLUS

DOCUMENT NUMBER: 127:309446

TITLE: Electrochemical analysis of thin film  
electrolytes and electrodes for application in  
rechargeable all solid state lithium  
microbatteries

AUTHOR(S): Birke, P.; Weppner, W.

CORPORATE SOURCE: Chair for Sensors and Solid State Ionics,  
Christian-Albrechts-Univ., Kiel, D-24143,  
Germany

SOURCE: Electrochimica Acta (1997), 42(20-22),  
3375-3384  
CODEN: ELCAAV; ISSN: 0013-4686

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The suitability of two important electrochem. exptl. methods,  
impedance spectroscopy and coulometric titration of ion insertion and  
extraction compds., has been examined for the investigation of thin film  
electrolytes and electrodes. These solid electrolytes and  
electrodes are employed in rechargeable lithium microbatteries which  
may be integrated into microchips and may serve as power sources for  
microstructures such as micromotors fabricated by the LIGA  
technique. Thin solid lithium electrolyte films with thicknesses of  
the order of 1  $\mu$ m have been rf-sputtered from a 4" + 1/4"  
uniaxially hot pressed LiBO<sub>2</sub> target. The ionic conductivity  $\sigma$  of the  
resulting thin solid electrolyte films and their activation energy  
EA have been determined by impedance spectroscopy. The investigation of  
thin solid electrolyte films required the development of a special  
exptl. setup. Thin electrode films with thicknesses in the range of  
several hundred nm were sputtered from 4" + 1/4" uniaxially  
hot pressed C and Li<sub>4</sub>Fe<sub>0.5</sub>Ti<sub>4.5</sub>O<sub>11.75</sub> targets. Coulometric titration  
expts. allow us to conclude that lithium can be reversibly inserted  
into and extracted from bulk graphite like carbon according to Li + 6C  
→ LiC<sub>6</sub> at nearly 0 V vs Li while in the case of bulk  
Li<sub>4</sub>Fe<sub>0.5</sub>Ti<sub>4.5</sub>O<sub>11.75</sub> 2.5 Li per formula unit can be reversibly  
inserted and extracted at 2.3 V vs Li according to the reduction of iron and  
at 1.55 V vs Li due to the reduction of titanium. In the present paper  
we present the effect of thin film electrodes on coulometric titrn  
curves.

IT 197395-46-3, Boron lithium nitride oxide (BLiN<sub>0.09</sub>O<sub>1.86</sub>)

RL: DEV (Device component use); USES (Uses)

(electrochem. anal. of thin film electrolytes and electrodes for application in rechargeable all solid state lithium microbatteries)

RN 197395-46-3 HCAPLUS

CN Boron lithium nitride oxide (BLiN0.0901.86) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0.09	17778-88-0
O	1.86	17778-80-2
B	1	7440-42-8
Li	1	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 72

IT 12192-58-4, Graphite lithium c6li 13453-69-5, Boron lithium oxide  
blio2 197395-46-3, Boron lithium nitride oxide  
(BLiN0.0901.86)

RL: DEV (Device component use); USES (Uses)  
(electrochem. anal. of thin film electrolytes and electrodes for application in rechargeable all solid state lithium microbatteries)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L17 ANSWER 14 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1996:634666 HCAPLUS

DOCUMENT NUMBER: 125:280140

TITLE: Foaming inorganic crystals and paints containing  
them as flame retardants or pigments

INVENTOR(S): Kani, Yoshihiro; Kato, Chika

PATENT ASSIGNEE(S): Taihei Chem Ind, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 08198609	A	19960806	JP 1995-42278	199501 23

PRIORITY APPLN. INFO.: JP 1995-42278

199501  
23

AB The crystals comprise, as main component, Al basic  
phosphate-phosphite double salts having a formula  
 $\text{Al}_x\text{M}_1\text{y}_1\text{M}_2\text{y}_2\ldots\text{M}_i\text{y}_i\text{Zn}_z(\text{PO}_4)\text{A}(\text{HPO}_3)_3(\text{OH})\text{BnH}_2\text{O}$  ( $\text{M}_1, \text{M}_2, \text{M}_i = \text{ammonium, alkali metal}; 1 \leq x < 4; \text{M}_1 = 0-6; \text{M}_2 = 0-6; \text{M}_i = 0-6; \text{Z} = 0-3; (\text{y}_1 + \text{y}_2 + \ldots + \text{y}_i + 2z)/x = 0.05-2; (3x + \text{y}_1 + \text{y}_2 + \ldots + \text{y}_i + 2z) = 6-12; \text{A} = 0.1-1.0; \text{B} 0.3-3.0; n = 0-6$ ), and optionally borates and/or silicates. Paints containing the crystals are also claimed.

IT 182442-70-2P

RL: PNU (Preparation, unclassified); PRP (Properties); TEM  
(Technical or engineered material use); PREP (Preparation); USES  
(Uses)

(foaming crystal from basic Al phosphate phosphite (and borate or  
silicate) for pigment or fireproofing agent in paint)

RN 182442-70-2 HCAPLUS

CN Aluminum ammonium lithium hydroxide phosphate phosphonate  
(Al<sub>2.8</sub>(NH<sub>4</sub>)<sub>0.5</sub>Li<sub>0.25</sub>(OH)(PO<sub>4</sub>)<sub>0.75</sub>(HPO<sub>3</sub>)<sub>3</sub>), hydrate (10:13) (9CI)  
(CA INDEX NAME)

CM 1

CRN 182442-69-9

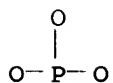
CMF Al . H4 N . H O3 P . H O . Li . O4 P

CCI TIS

CM 2

CRN 15477-76-6

CMF H O3 P



ONE OR MORE TAUTOMERIC DOUBLE BONDS NOT DISPLAYED IN THE STRUCTURE

CM 3

CRN 14798-03-9

CMF H4 N



CM 4

CRN 14280-30-9

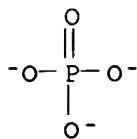
CMF H O



CM 5

CRN 14265-44-2

CMF O4 P



CM 6

CRN 7439-93-2

CMF Li

Li

CM 7

CRN 7429-90-5

CMF Al

Al

IC ICM C01B025-163

ICS C09D005-00; C09D005-18

CC 49-5 (Industrial Inorganic Chemicals)

Section cross-reference(s): 42

IT 182442-70-2P 182442-72-4P 182442-74-6P 182442-76-8P

182579-26-6P

RL: PNU (Preparation, unclassified); PRP (Properties); TEM

(Technical or engineered material use); PREP (Preparation); USES

(Uses)  
(foaming crystal from basic Al phosphate phosphite (and borate or silicate) for pigment or fireproofing agent in paint)

L17 ANSWER 15 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1996:351162 HCAPLUS

DOCUMENT NUMBER: 125:45608

TITLE: Effect of cation or anion substitution in the LiNH<sub>4</sub>SO<sub>4</sub> phase transitions

AUTHOR(S): Sarrion, M. L. Martinez; Mestres, L.; Bakkali, A.; Bocanegra, E. H.

CORPORATE SOURCE: Dpto. de Quimica Inorganica, Universidad de Barcelona, Barcelona, Spain

SOURCE: Boletin de la Sociedad Espanola de Ceramica y Vidrio (1995), 34(5 Y 6), 458-462

CODEN: BSCVB9; ISSN: 0366-3175

PUBLISHER: Sociedad Espanola de Ceramica y Vidrio

DOCUMENT TYPE: Journal

LANGUAGE: Spanish

AB  $\beta$ -LiNH<sub>4</sub>SO<sub>4</sub> ( $\beta$  LAS) undergoes two phase transitions at .apprx.10° and 186°. The intermediate phase is ferroelec. The effect of the partial substitution of the NH<sub>4</sub><sup>+</sup> cation by Rb, and sulfate anion by selenate in  $\beta$  LiNH<sub>4</sub>SO<sub>4</sub>, on these phase transitions was studied. The region of existence of the

solid solns.  $\text{Li}(\text{NH}_4)_{1-x}\text{Rb}_x\text{SO}_4$  and  $\text{LiNH}_4(\text{SO}_4)_{1-x}(\text{SeO}_4)_x$  in which the structure of  $\beta$ -LAS is maintained was established. The presence of selenate anions or Rb cations affects the temps. of both phase transitions. Therefore the tetrahedral sulfate as well as the  $\text{NH}_4^+$  cations take part in these transitions. There is a cooperative effect between the disorder of the sulfate groups and the distortions of the  $\text{NH}_4^+$  tetrahedra. The mechanism that best justifies these phase transitions is a order-disorder mechanism.

IT 129713-53-7, Ammonium lithium rubidium sulfate  
 $((\text{NH}_4)_0-1\text{LiRb}_0-1\text{SO}_4)$   
 RL: PEP (Physical, engineering or chemical process); PRP  
 (Properties); PROC (Process)  
 (phase transitions in)  
 RN 129713-53-7 HCAPLUS  
 CN Ammonium lithium rubidium sulfate  $([(\text{NH}_4),\text{Rb}]\text{Li}(\text{SO}_4))$  (CA INDEX  
 NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0 - 1	14798-03-9
Rb	0 - 1	7440-17-7
Li	1	7439-93-2

CC 75-7 (Crystallography and Liquid Crystals)

Section cross-reference(s): 69, 76

IT 129713-53-7, Ammonium lithium rubidium sulfate  
 $((\text{NH}_4)_0-1\text{LiRb}_0-1\text{SO}_4)$  178156-04-2, Ammonium lithium selenate  
 sulfate  $(\text{NH}_4\text{Li}(\text{SeO}_4)_0-1(\text{SO}_4)_0-1)$   
 RL: PEP (Physical, engineering or chemical process); PRP  
 (Properties); PROC (Process)  
 (phase transitions in)

L17 ANSWER 16 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1995:233329 HCAPLUS

DOCUMENT NUMBER: 122:149977

TITLE: Ion-exchange properties of lithium aluminum  
 layered double hydroxides

AUTHOR(S): Chisem, Ian C.; Jones, William

CORPORATE SOURCE: Dep. Chem., Univ. Cambridge, Cambridge, CB2 1EW,  
 UK

SOURCE: Journal of Materials Chemistry (1994),  
 4(11), 1737-44

CODEN: JMACEP; ISSN: 0959-9428

PUBLISHER: Royal Society of Chemistry

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The synthesis of layered Li Al hydrotalcite-like materials is described along with different anion exchange procedures for the preparation of materials intercalated with chloride, nitrate and vanadate. The products were characterized using elemental chemical anal., powder x-ray diffraction, FTIR spectroscopy and TGA. The matrixes are reasonably stable to acid treatment at pH 4.5 for periods of up to 72 h, with anion exchange taking place. Total exchange of interlayer carbonate for chloride, nitrate and vanadate may be accomplished. The thermal properties of the materials were studied: they demonstrate interesting differences in thermal behavior compared with hydrotalcite.

IT 161186-56-7P, Aluminum lithium hydroxide nitrate

(Al<sub>0.68</sub>Li<sub>0.32</sub>(OH)<sub>2</sub>(NO<sub>3</sub>)<sub>0.36</sub>)

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of intercalated lithium aluminum layered double hydroxides)

RN 161186-56-7 HCAPLUS

CN Aluminum lithium hydroxide nitrate (Al<sub>0.68</sub>Li<sub>0.32</sub>(OH)<sub>2</sub>(NO<sub>3</sub>)<sub>0.36</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
NO <sub>3</sub>	0.36	14797-55-8
HO	2	14280-30-9
Li	0.32	7439-93-2
Al	0.68	7429-90-5

CC 78-3 (Inorganic Chemicals and Reactions)

IT 68949-09-7P, Aluminum lithium chloride hydroxide (Al<sub>2</sub>LiCl(OH)<sub>6</sub>)  
117872-70-5P, Aluminum lithium hydroxide nitrate (Al<sub>2</sub>Li(OH)<sub>6</sub>(NO<sub>3</sub>))  
161186-56-7P, Aluminum lithium hydroxide nitrate  
(Al<sub>0.68</sub>Li<sub>0.32</sub>(OH)<sub>2</sub>(NO<sub>3</sub>)<sub>0.36</sub>) 161214-41-1DP, intercalation product  
with sodium vanadate 161214-43-3P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of intercalated lithium aluminum layered double hydroxides)

L17 ANSWER 17 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1993:44281 HCAPLUS

DOCUMENT NUMBER: 118:44281

TITLE: Manufacture of  $\alpha$ -Sialon ceramics

INVENTOR(S): Mitomo, Mamoru; Ishizawa, Kenki; Ayusawa, Nobuo;  
Shironita, Akira; Takai, Masamichi; Akizuki,  
Toshihiko

PATENT ASSIGNEE(S): National Institute for Research in Inorganic  
Materials, Japan; Shinagawa Refractories Co.,  
Ltd.

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 04144969	A	19920519	JP 1990-269089	199010 06

PRIORITY APPLN. INFO.:

JP 1990-269089

199010  
06

AB Powdered Si nitride containing  $\geq 15$  weight%  $\beta$ -Si<sub>3</sub>N<sub>4</sub>, AlN, and a metal M (Li, Ca, Mg, Y, or lanthanide (except La and Ce)) oxide are mixed to obtain  $\alpha$ -Sialon M<sub>x</sub>(Si, Al)<sub>12</sub>(O, N)<sub>16</sub>, where  $0 < x \leq 0.8$ , and the mixture is molded and sintered at 1600-2000° in a nonoxidizing atmosphere. The mixture optionally contains 0.5-40 weight% oxide, nitride, carbide, or boride of a metal

which is not soluble in  $\alpha$ -Sialon, e.g., SiO<sub>2</sub>, CeO<sub>2</sub>, ZrO<sub>2</sub>, BN, TiN, TiC, B<sub>4</sub>C, SiC, WC, CrC, TiB<sub>2</sub>, and ZrB<sub>2</sub>. High-d.  $\alpha$ -Sialon ceramics are manufactured by using an inexpensive starting material containing a large ratio of  $\beta$ -Si<sub>3</sub>N<sub>4</sub>.

IT 145139-99-7P, Aluminum lithium silicon nitride oxide  
((Al,Si)<sub>12</sub>Li<sub>0.2-0.5</sub>(N,O)<sub>16</sub>)

RL: PREP (Preparation)

( $\alpha$ -, ceramics, manufacture of, from starting material rich in  $\beta$ -silicon nitride)

RN 145139-99-7 HCAPLUS

CN Aluminum lithium silicon nitride oxide ((Al,Si)<sub>12</sub>Li<sub>0.2-0.5</sub>(N,O)<sub>16</sub>)  
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0 - 16	17778-88-0
O	0 - 16	17778-80-2
Si	0 - 12	7440-21-3
Li	0.2 - 0.5	7439-93-2
Al	0 - 12	7429-90-5

IC ICM C04B035-58

CC 57-2 (Ceramics)

IT 51184-13-5P, Sialon 107477-72-5P, Aluminum silicon yttrium nitride oxide ((Al,Si)<sub>6</sub>Y<sub>0.1</sub>(N,O)<sub>8</sub>) 110832-41-2P, Aluminum silicon yttrium nitride oxide ((Al,Si)<sub>12</sub>Y<sub>0-0.8</sub>(N,O)<sub>16</sub>) 144276-69-7P, Aluminum silicon yttrium nitride oxide ((Al,Si)<sub>12</sub>Y<sub>0.5</sub>(N,O)<sub>16</sub>) 145139-99-7P, Aluminum lithium silicon nitride oxide ((Al,Si)<sub>12</sub>Li<sub>0.2-0.5</sub>(N,O)<sub>16</sub>) 145140-00-7P, Aluminum magnesium silicon nitride oxide ((Al,Si)<sub>12</sub>Mg<sub>0.2-0.5</sub>(N,O)<sub>16</sub>) 145359-26-8P, Aluminum calcium silicon nitride oxide ((Al,Si)<sub>12</sub>Ca<sub>0-0.8</sub>(N,O)<sub>16</sub>)  
RL: PREP (Preparation)

( $\alpha$ -, ceramics, manufacture of, from starting material rich in  $\beta$ -silicon nitride)

L17 ANSWER 18 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1992:618582 HCAPLUS

DOCUMENT NUMBER: 117:218582

TITLE: Silicon nitride structural ceramics, and their manufacture

INVENTOR(S): Ukyo, Yoshio; Wada, Shigetaka

PATENT ASSIGNEE(S): Toyota Central Research and Development Laboratories, Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.  
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 04209764	A	19920731	JP 1990-338951	199011 30

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PRIORITY APPLN. INFO.: JP 1990-338951

199011

30

&lt;--

AB The ceramics comprise  $M_x(Al, Si)_{12}(O, N)_{16}$  ( $M = Li, Ca, Mg$ , and/or  $Y$ ;  $0 < x \leq 2$ ) and  $Si_{6-z}Al_zO_zN_{8-z}$  ( $0 < z \leq 4.2$ ;  $x$  and/or  $z$  multiple value). The process comprises mixing 2 kinds of  $Si_3N_4$  powders,  $\geq 1$  of which has  $\geq 2$  different average grain sizes, and firing the mixture.

IT 124546-02-7, Aluminum lithium silicon nitride oxide  
 $((Al, Si)_{12}LiO_{-2}(N, O)_{16})$   
 RL: USES (Uses)  
 (ceramics, for high-temperature structural components)

RN 124546-02-7 HCAPLUS

CN Aluminum lithium silicon nitride oxide  $((Al, Si)_{12}LiO_{-2}(N, O)_{16})$  (9CI)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0 - 16	17778-88-0
O	0 - 16	17778-80-2
Si	0 - 12	7440-21-3
Li	0 - 2	7439-93-2
Al	0 - 12	7429-90-5

IC ICM C04B035-58

CC 57-2 (Ceramics)

IT 51184-13-5, Aluminum silicon nitride oxide 110781-48-1, Aluminum magnesium silicon nitride oxide  $((Al, Si)_{12}MgO_{-2}(N, O)_{16})$   
 122989-49-5, Aluminum silicon yttrium nitride oxide  
 $((Al, Si)_{12}YO_{-2}(N, O)_{16})$  124546-01-6, Aluminum calcium silicon nitride oxide  $((Al, Si)_{12}CaO_{-2}(N, O)_{16})$  124546-02-7,  
 Aluminum lithium silicon nitride oxide  $((Al, Si)_{12}LiO_{-2}(N, O)_{16})$   
 RL: USES (Uses)  
 (ceramics, for high-temperature structural components)

L17 ANSWER 19 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1990:562959 HCAPLUS

DOCUMENT NUMBER: 113:162959

TITLE: Phase transitions in the mixed crystals lithium rubidium ammonium sulfate  $(LiRb_{1-x}(NH_4)_xSO_4)$

AUTHOR(S): Kawamura, K.; Kuramashi, A.; Nakamura, H.;  
 Kasano, H.; Mashiyama, H.; Nakanishi, S.; Itoh, H.

CORPORATE SOURCE: Fac. Sci., Yamaguchi Univ., Yamaguchi, 753, Japan

SOURCE: Ferroelectrics (1990), 105, 279-84  
 CODEN: FEROA8; ISSN: 0015-0193

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The successive phase transitions of  $LiRbSO_4$ - $LiNH_4SO_4$  systems were studied by x-ray diffraction, dielec. measurement, thermal anal., and second harmonic generation detection as functions of temperature and  $NH_4$  concentration  $x$ . Although the  $NH_4$  ion is almost of the same size as the  $Rb$  ion, a small amount of  $NH_4$  reduces the transition temps. and the incommensurate and the 5-fold commensurate phases of  $LiRbSO_4$  fade out for  $x > 0.1$ . With further replacing  $Rb$  by  $NH_4$ , the antiferroelec. phase of  $LiRbSO_4$  does not appear and the phase sequence is similar to  $LiNH_4SO_4$  for  $x > 0.25$ . The phase diagram and the modulated structure are discussed in reference to an Ising model with long range interactions.



IT 129713-11-7, Ammonium lithium rubidium sulfate  
 ((NH<sub>4</sub>)<sub>0.38</sub>LiRb<sub>0.62</sub>(SO<sub>4</sub>)) 129713-53-7, Ammonium lithium  
 rubidium sulfate ((NH<sub>4</sub>),Rb]Li(SO<sub>4</sub>)) 129713-54-8, Ammonium  
 lithium rubidium sulfate ((NH<sub>4</sub>)<sub>0.02</sub>LiRb<sub>0.98</sub>(SO<sub>4</sub>))  
 129713-55-9, Ammonium lithium rubidium sulfate  
 ((NH<sub>4</sub>)<sub>0.27</sub>LiRb<sub>0.73</sub>(SO<sub>4</sub>))

RL: PRP (Properties)

(phase transitions in crystals of)

RN 129713-11-7 HCAPLUS

CN Ammonium lithium rubidium sulfate ((NH<sub>4</sub>)<sub>0.38</sub>LiRb<sub>0.62</sub>(SO<sub>4</sub>)) (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0.38	14798-03-9
Rb	0.62	7440-17-7
Li	1	7439-93-2

RN 129713-53-7 HCAPLUS

CN Ammonium lithium rubidium sulfate ((NH<sub>4</sub>),Rb]Li(SO<sub>4</sub>)) (CA INDEX  
 NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0 - 1	14798-03-9
Rb	0 - 1	7440-17-7
Li	1	7439-93-2

RN 129713-54-8 HCAPLUS

CN Ammonium lithium rubidium sulfate ((NH<sub>4</sub>)<sub>0.02</sub>LiRb<sub>0.98</sub>(SO<sub>4</sub>)) (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0.02	14798-03-9
Rb	0.98	7440-17-7
Li	1	7439-93-2

RN 129713-55-9 HCAPLUS

CN Ammonium lithium rubidium sulfate ((NH<sub>4</sub>)<sub>0.27</sub>LiRb<sub>0.73</sub>(SO<sub>4</sub>)) (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	1	14808-79-8
H4N	0.27	14798-03-9
Rb	0.73	7440-17-7
Li	1	7439-93-2

CC 75-7 (Crystallography and Liquid Crystals)

Section cross-reference(s): 76

IT 129713-11-7, Ammonium lithium rubidium sulfate  
 ((NH<sub>4</sub>)<sub>0.38</sub>LiRb<sub>0.62</sub>(SO<sub>4</sub>)) 129713-12-8, Ammonium lithium rubidium

sulfate ((NH<sub>4</sub>)<sub>0.55</sub>LiRb<sub>0.45</sub>(SO<sub>4</sub>)) 129713-53-7, Ammonium lithium rubidium sulfate ((NH<sub>4</sub>),Rb]Li(SO<sub>4</sub>)) 129713-54-8, Ammonium lithium rubidium sulfate ((NH<sub>4</sub>)<sub>0.02</sub>LiRb<sub>0.98</sub>(SO<sub>4</sub>)) 129713-55-9, Ammonium lithium rubidium sulfate ((NH<sub>4</sub>)<sub>0.27</sub>LiRb<sub>0.73</sub>(SO<sub>4</sub>))

RL: PRP (Properties)

(phase transitions in crystals of)

L17 ANSWER 20 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1990:41370 HCAPLUS

DOCUMENT NUMBER: 112:41370

TITLE: Sintered Sialon articles

INVENTOR(S): Ukyo, Yoshio; Wada, Shigetaka; Takatori, Kazumasa

PATENT ASSIGNEE(S): Toyota Central Research and Development Laboratories, Inc., Japan

SOURCE: Eur. Pat. Appl., 16 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 336377	A2	19891011	EP 1989-105904	19890404
EP 336377	A3	19900117		
EP 336377	B1	19931103		
EP 336377	B2	19970716		
R: DE, FR, GB				
JP 02044066	A	19900214	JP 1989-87807	19890406
JP 2736386	B2	19980402		
US 4978645	A	19901218	US 1989-334553	19890407
PRIORITY APPLN. INFO.:			JP 1988-86721	A 19880407

AB Sintered Sialon articles comprise  $\alpha$ -Sialon and  $\beta$ -Sialon with the ratio of their X-ray diffraction peak strengths = (0.05-0.5):(0.5-0.95) and average crystal grain size  $\leq 2.0 \mu\text{m}$  for  $\alpha$ -Sialon and  $\leq 5.0 \mu\text{m}$  for  $\beta$ -Sialon in major axis and  $\leq 1.0 \mu\text{m}$  in minor axis. The  $\alpha$ -Sialon is  $\text{Mx}(\text{Si},\text{Al})_{12}(\text{O},\text{N})_{16}$  where  $0 < x \leq 2$  and M is  $\geq 1$  Li, Mg, Ca, and Y; and  $\beta$ -Sialon is  $\text{Si}_6\text{-yAl}_y\text{O}_y\text{N}_{8\text{-y}}$  with  $0 < y \leq 4.2$ . The articles have high strength and toughness, is resistant to oxidation, and can be used as a high-temperature structural material.

IT 124546-02-7, Aluminum lithium silicon nitride oxide ((Al,Si)<sub>12</sub>Li<sub>0-2</sub>(N,O)<sub>16</sub>)

RL: USES (Uses)

(ceramics containing  $\beta$ -Sialon and, with small crystal grain size, for strength and toughness and oxidation resistance)

RN 124546-02-7 HCAPLUS

CN Aluminum lithium silicon nitride oxide ((Al,Si)<sub>12</sub>LiO-2(N,O)<sub>16</sub>) (9CI)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
N	0 - 16	17778-88-0
O	0 - 16	17778-80-2
Si	0 - 12	7440-21-3
Li	0 - 2	7439-93-2
Al	0 - 12	7429-90-5

IC ICM C04B035-58

CC 57-2 (Ceramics)

IT 110781-48-1, Aluminum magnesium silicon nitride oxide ((Al,Si)<sub>12</sub>MgO-2(N,O)<sub>16</sub>) 122989-49-5, Aluminum silicon yttrium nitride oxide ((Al,Si)<sub>12</sub>YO-2(N,O)<sub>16</sub>) 124546-00-5, Aluminum silicon yttrium nitride oxide ((Al,Si)<sub>12</sub>YO<sub>0.3-0.6</sub>(N,O)<sub>16</sub>) 124546-01-6, Aluminum calcium silicon nitride oxide ((Al,Si)<sub>12</sub>CaO-2(N,O)<sub>16</sub>) 124546-02-7, Aluminum lithium silicon nitride oxide ((Al,Si)<sub>12</sub>LiO-2(N,O)<sub>16</sub>)

RL: USES (Uses)

(ceramics containing  $\beta$ -Sialon and, with small crystal grain size, for strength and toughness and oxidation resistance)

L17 ANSWER 21 OF 21 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1990:11016 HCAPLUS

DOCUMENT NUMBER: 112:11016

TITLE: Manufacture of sintered Sialon-based articles

INVENTOR(S): Nakayasu, Tetsuo; Kamitoku, Yasuhiko

PATENT ASSIGNEE(S): Ube Industries, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 63319269	A	19881227	JP 1987-151057	19870619

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JP 04061834 B 19921002  
PRIORITY APPLN. INFO.: JP 1987-151057

19870619

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AB The articles, containing crystalline granules of  $\alpha$ -Sialon  $M_x(Si,Al)_{12}(O,N)_{16}$  ( $M = Li, Mg, Ca, Y$ , or lanthanide metal other than La and Ce,  $0 < x \leq 2$ ), crystalline needles of  $\beta$ -Sialon  $Si_6-zAl_zO_zN_{6-z}$  ( $0 < z \leq 4.2$ ), and a M-containing glass phase, are prepared by mixing raw  $\alpha$ -Sialon powder, according to the above formula and containing <8% excess O, with  $Si_3N_4$  powder, and sintering the mixture at 1600-1900° in a N-containing atmospheric These articles

have high fracture toughness and high high-temperature strength, and are useful as wear- and heat-resistant material for cutting chips, rolls, etc.

IT 124164-55-2P

RL: PREP (Preparation)

( $\alpha$ -Sialon, ceramics containing crystalline needles of  $\beta$ -Sialon and crystalline granules of, manufacture of)

RN 124164-55-2 HCAPLUS

CN Aluminum lithium silicon nitride oxide silicate ((Al,Si)<sub>12</sub>LiO-2(N,O)<sub>16</sub>(Si<sub>2</sub>O<sub>5</sub>))O-3.2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O5Si2	0 - 3.2	20328-07-8
N	0 - 16	17778-88-0
O	0 - 16	17778-80-2
Si	0 - 12	7440-21-3
Li	0 - 2	7439-93-2
Al	0 - 12	7429-90-5

IC ICM C04B035-58

CC 57-2 (Ceramics)

IT 122989-49-5P, Aluminum silicon yttrium nitride oxide  
((Al,Si)<sub>12</sub>Y<sub>0-2</sub>(N,O)<sub>16</sub>) 124164-55-2P 124164-56-3P  
124182-31-6P

RL: PREP (Preparation)

( $\alpha$ -Sialon, ceramics containing crystalline needles of  $\beta$ -Sialon and crystalline granules of, manufacture of)

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